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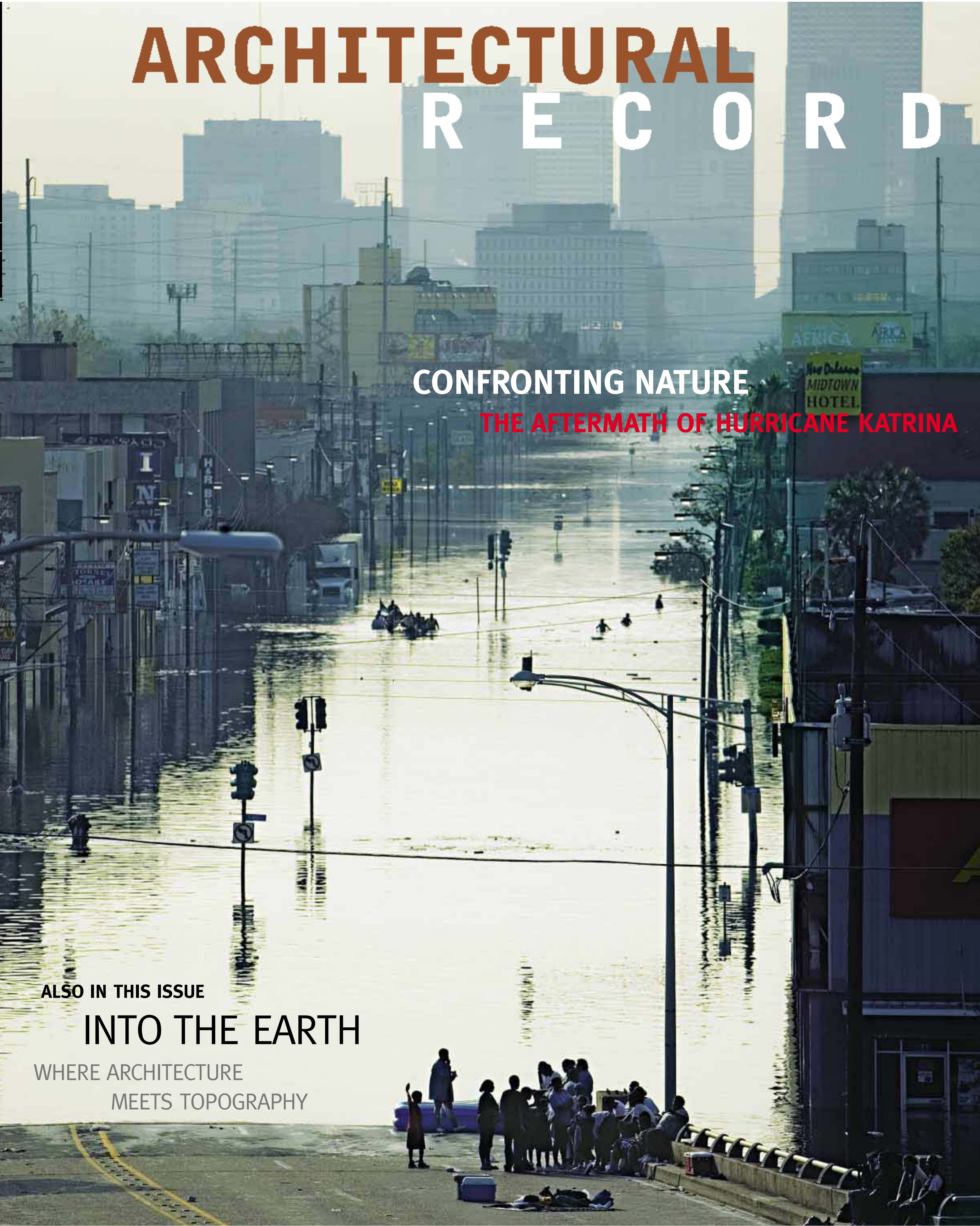
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On the Cover: *Highway 61 Entering New Orleans. Photograph by Neil Alexander*
Right: *Chichu Art Museum. Photograph by Tadao Ando*

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This month in Continuing Education

October 2005

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Designing with American Hardwoods: A Sustainable, Versatile Material Choice

Sponsor: The Hardwood Council

LEARNING OBJECTIVES:

- Explore environmentally preferable uses of American hardwoods.
- Specify and use American hardwoods more effectively and sustainably.
- Understand how life cycle thinking facilitates green building products assessment.

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Fluid Applied Air/Moisture Barriers for Moisture Control and Mold Prevention in Wall Construction

Sponsor: Sto Corp.

LEARNING OBJECTIVES:

- Know the components of fluid applied air/moisture barriers.
- Compare the advantages of fluid air/moisture barriers with building wraps and other moisture barriers.
- Identify design considerations when incorporating fluid applied air/moisture barrier systems into wall assemblies.

This month at archrecord.construction.com

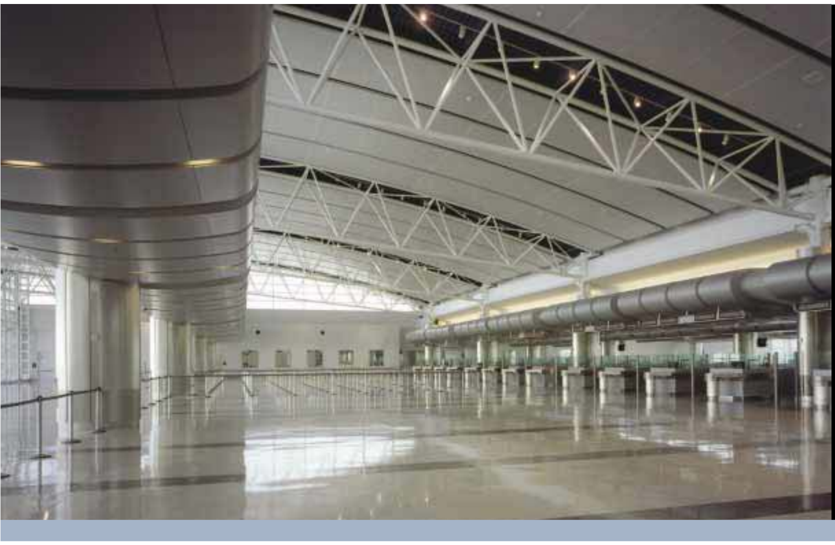

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Photo: Richard Payne, FAIA

Building Types Study–Airports

As airline woes again drive rock-bottom American airport designs, international hubs make passenger amenity a priority. Airports featured are in Madrid, Spain; Tel Aviv, Israel; Dallas/Ft. Worth, Texas; and Seattle/Tacoma, Washington.

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METAL INITIATIVE

Hardouin House, Austin, Texas
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Courtesy Alterstudio

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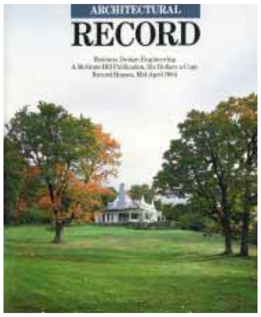
In Design, an Austin firm moves from residential projects to the big time with a commission for a hotel. Also, young architects in Chicago take on the challenge of urban recycling.

New Orleans
Courtesy FEMA

Special Feature

McGraw-Hill Construction is working to bring you the latest industry-related news from hurricane-affected areas, including Podcasts and other multi-media resources to help you find answers.



Record Houses 50 cover.
Mid-April 1984

Residential

California's inspired anti-sprawl solution? Bring new life to the suburbs. Also, Record House of the month.

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Letters

A time to rebuild

As you can imagine, New Orleans, Baton Rouge, and the region will forever be changed. Hurricane Katrina and the second disaster of levees breaking has been a tragedy of historical proportions.

Our local professional landscape is also deeply affected. Displaced owners of architectural practices and related building professionals of all types, such as urban planners, interior designers, landscape architects, engineers, and contractors, are pouring into our community from all affected parishes. Business owners and their employees have lost everything, including property, equipment, and records. Many are taking immediate action to move their operations to new locations, such as Baton Rouge, Louisiana's state capital and the nearest functioning city west of Hurricane Katrina's impact zone. Myself and colleagues in the Baton Rouge design community are proactively assisting many of these people in their search for office space and employment.

In the meantime, I believe that our profession will find itself called to new levels of responsibility and leadership. It is important for all architects to seek direction from the AIA on how to participate in the emergency response while preparing for a spike in workload as relief and recovery actions begin. Moreover, now is the time for our profession and its leaders to reach out with elected officials to gather information from resources like the AIA for studies and best practices on rebuilding after such physical devastation, as well as planning for rapid expansion as will occur in Baton Rouge and other locations.

While we personally find ways to aid the relief effort, we are preparing for the rebuilding by spearheading the organization of a team of thinkers to define and respond to the design challenges that lie ahead, the greatest of which will be to reconceptualize the engineering and architectural strategies of one of the world's most unique urban environments known for its food, music, social history, and exquisite examples of vernacular and historical architecture descending from the intersection of French, African, Spanish, and Caribbean influences.

—Trey Trehan, AIA
Baton Rouge, La.

An architects' union when?

After reading about the split in the UFL/CIO, I was reminded of when I first started working in New York City in the 1960s. At the time, there had been an effort by some architects to unionize the profession. It was in response to low wages, but mainly related to the long hours: 60 hours a week or more and being paid for only 40. This was prevalent then and is probably more prevalent now. I know a number of young architects who are working under these conditions.

We all know the reason for this: too few jobs along with many who will work for almost nothing just to be involved in professional work. Also, there still persists the notion that architecture is such a wonderful profession that money is not important; anyone who wants a decent salary and humane working hours is often considered not fit for the creative work.

I'm surprised that unionizing the profession hasn't been attempted since then.

—Roy A Euker, AIA
New York City

Screwed up

Why not consider moving the proposed Santiago Calatrava design for the Chicago waterfront to the World Trade Center site? I can think of no better symbol for the fiasco that has become the Freedom Tower than a giant, undulating screw emerging from lower Manhattan.

—Andrew D. Kelton
Via e-mail

Disturbing developments

I wanted to thank you for including Paul Goldberger's Commentary [page 61] and Robert Campbell's Critique [page 67] in your September issue. I, too, have been disturbed by the developments that have taken place concerning the rebuilding of the World Trade Center site over the past four years. Not only have the solutions proposed thus far been disappointing from an architectural and urbanistic point of view, but the politics that surround everyone from the governor to the architect(s) must be described, at best, as disgusting. Four years ago, the World Trade Center site presented the most important urban and architectural opportunity in our country in recent history; now, it is clear that both architects and the American people have foolishly decided not to take advantage of their chance to demonstrate leadership and strength, but instead to fall back on a self-serving, backward-looking tangle of mediocrity.

Well, folks, we now have another chance. In light of the destruction that Hurricane Katrina wrought over more than 200 miles of the Gulf Coast, it is now whole cities that need our attention. In my eternal optimism, I want to believe that this can and will be different, and that we will not, once again, fall back on old tricks. This is a time where we need leadership and vision, not celebrity and fashion. The rebuilding of the Gulf Coast will take years of hard work and strong leadership. In the past, architects have been content to give up their responsibility, and this lack of conviction, while perhaps lucrative for the profession, is deadly to the world around us. We have forgotten the critical point that, more important than the desires of any client, architecture has a social role to fulfill. Ultimately, architecture is not just about passing the buck to make a buck, it's about being a part of the process that creates meaningful places that become part of our daily lives.

—James Fullton
New Haven

A sad state

Thank you for Paul Goldberger's Commentary and Robert Campbell's Critique of the latest Freedom Tower design. I agree wholeheartedly with both of the these bold analyses and, sadly, must concur with Mr. Campbell's wish that this tower never gets built. The World Trade Center project has become an embarrassing example of dysfunction at many levels. That so many talented, capable, and well-intentioned people could have arrived at this state of affairs makes me afraid for the future of our country, particularly in the light of the next challenge we will face: the rebuilding of New Orleans.

—Chris Miller, AIA
Woodstock, Vt.

Corrections

In the September Tech Briefs [page 179] about Chicago's Mandatum, the artist, Brother Mark Elder, and the architecture firm involved, Vasilko and Associates Architects, should have been given credit. In September's feature on the Robin Hood Foundation's library initiatives [page 86], Marion Weiss and Michael Manfredi should have been designated as codesigners of the library at P.S. 42. In July's Walker Art Center story [page 98], Christian Richters was not credited for his photo (upper right). In June's article on the Yawkey Center [page 126], Viola Rouhani, AIA, should have been designated AIA.

Send letters to rivy@mcgraw-hill.com.

Elegy for a Dream Queen

Editorial

By Robert Ivy, FAIA

When the weather forecasters began to warn that the hurricane might take a turn up the Mississippi River, pass over our scented, magical city, then stall over Lake Pontchartrain, dumping millions of gallons of water on New Orleans, I took one look at my wife and said, "We're leaving." She was six months pregnant. So as the city hunkered into an eerie quietude, and superhuman force transformed rain into a shower of small nails, we filled up the car, locked the door, and headed up Calhoun Street, out onto the freeways, and ultimately across the causeway.

It was a harrowing journey, buffeted by winds kicking up whitecaps across the lake, the car rocking from side to side in the gray hours of the early morning exodus. Holly sat quietly in the adjacent seat, clearly petrified, but not letting on. I gripped the wheel like the helm of a sailboat and headed north, my palms slippery and warm. Little did we know that high winds would follow us 250 miles up the Interstate, reminding us of the daunting night we had just passed through, all accompanied by weather updates from the radio. Hours later we made it to the hermetic safety of my parents' home, but not without regrets.

Like anyone who has ever left the place, we felt we had abandoned the shade-filled city that normally sheltered us from the subtropical sun. No place, before or since, has so pervasively affected our emotions as New Orleans, tingeing our daily lives, and our subsequent brief encounters, with the blues: She hurt, but hurt so good. It was almost as if the city breathed, she was so tangible, so it pained us to leave.

But our evacuation didn't happen this year. The hurricane was Carmen, not Katrina, the year was 1974, and she ultimately skipped past New Orleans, as major storms had done since Betsy in the 1960s. As scores of commentators have reported, the city has been facing this reality for decades. Ultimately, my son was born, grew up, and had children of his own with no memory of our flight. Neither our caution, fear, nor feelings infected them.

This time, New Orleans's luck ran out, and there is no one to blame but indifferent Nature, with a capital N. *We are all hurt, anyone who has lived there and loved the place, hurt for all the pain the current residents feel, losing family members or friends, losing homes, possessions, but all we can do today is grieve. We also sense a physical reaction to the violation of our city—cultivated, civilized, greener than imagination, rich, fading, renewing, odorous, open—God, we have all loved her.*

Now, the evacuees have been forced to leave, as if a corpse were taking last gasps, as we, the survivors, look on from glowing screens. What can we do? How can we help? At this moment, still deep in the overburden of lake water, our path seems unclear, except for reaching out to the expected sources. The late Walker Percy, New Orleanian, addressed the plight of onlookers to tragedy in his book The Message in the Bottle.

However, I'm too committed to give up or to abandon feeling. While the Dream Queen may be struck down, she's been mortally wounded before by disease and fire, by war and flood. Waters will recede; she'll pull up and remake herself, not dead or dying, but ready for a fight and another dance. Like me, too many people love her. She cannot fail—only fade for a while.

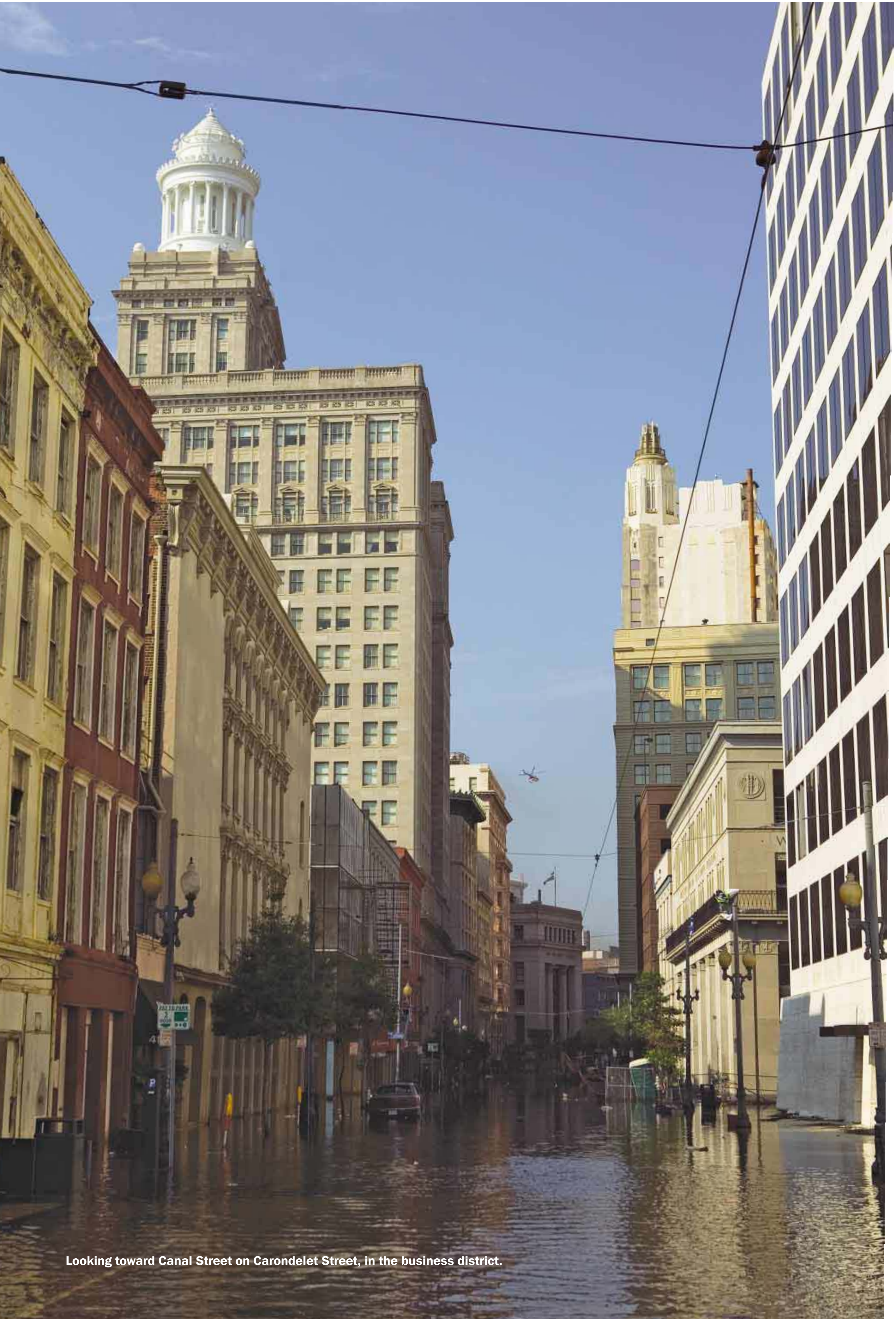
The casualties, however, will not return. No one can replace a single spouse lost to flood, or quell demons haunting a traumatized child. We have to rebuild, and build better, avoiding cheap solutions, lowest bids, and graft. The vast history of the place (which looms like a form of interlocking human memory) demands it, and we are intent on restoring her to her splendid life. We'll dry her out, clean her up: She's ingrained in us.

Sleep tonight, old beauty. We're coming back.

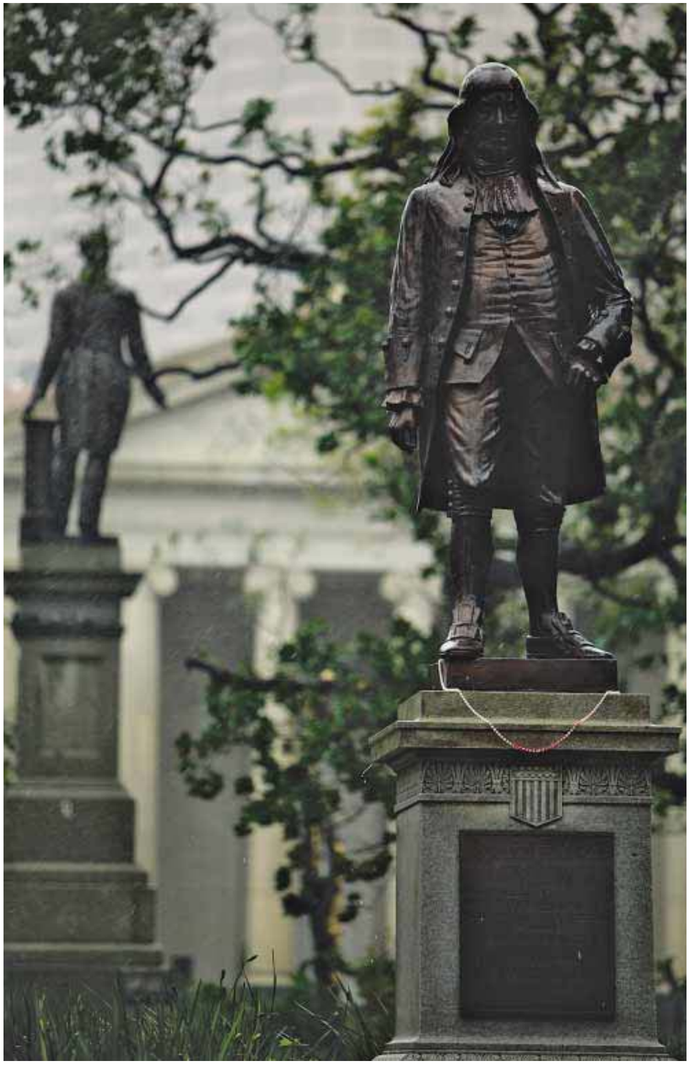
Robert Ivy

Note: Mississippi native Robert Ivy wrote this essay and posted it to our Web site, www.archrecord.com, the day after the levee broke in New Orleans, where he once lived.

PHOTOGRAPHY: © NEIL ALEXANDER



Looking toward Canal Street on Carondelet Street, in the business district.

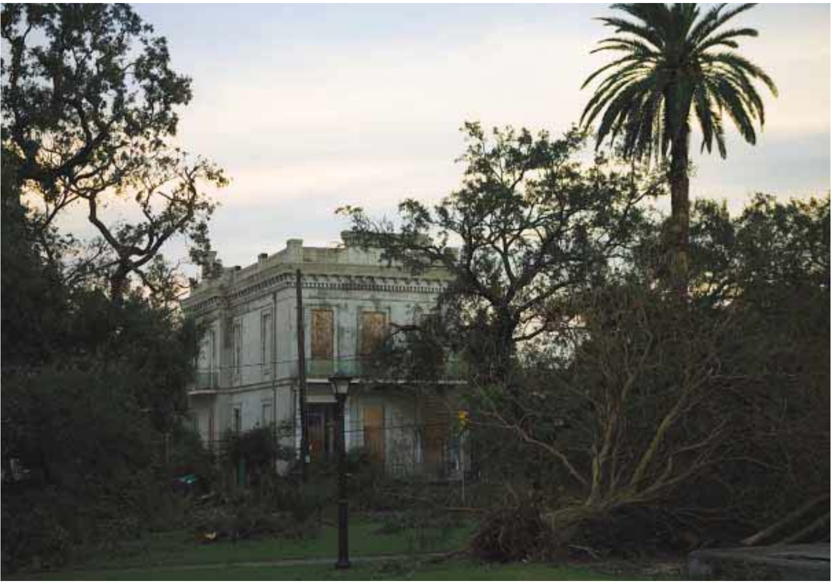


Right: Statues of Henry Clay and Benjamin Franklin stand alone in the once-tree-shaded Lafayette Square.

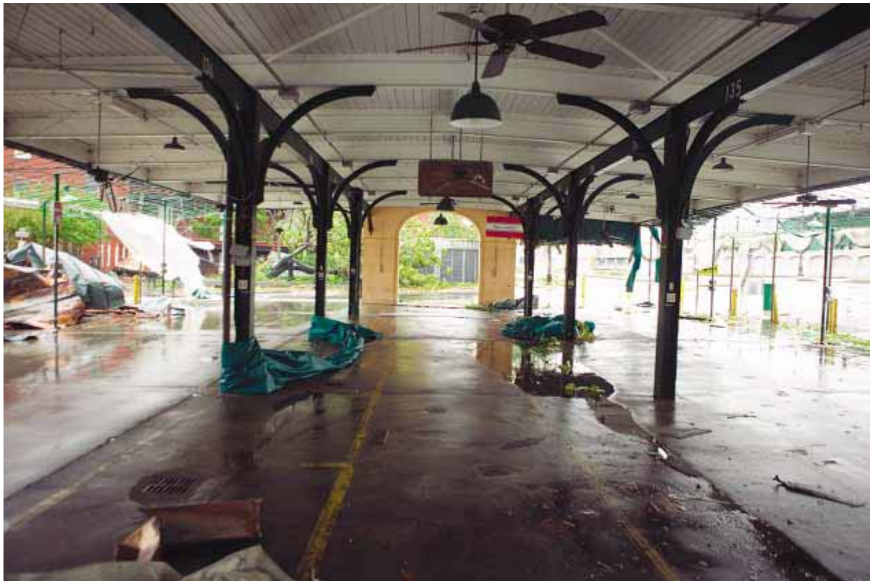
New Orleans in the aftermath

Photography by Neil Alexander

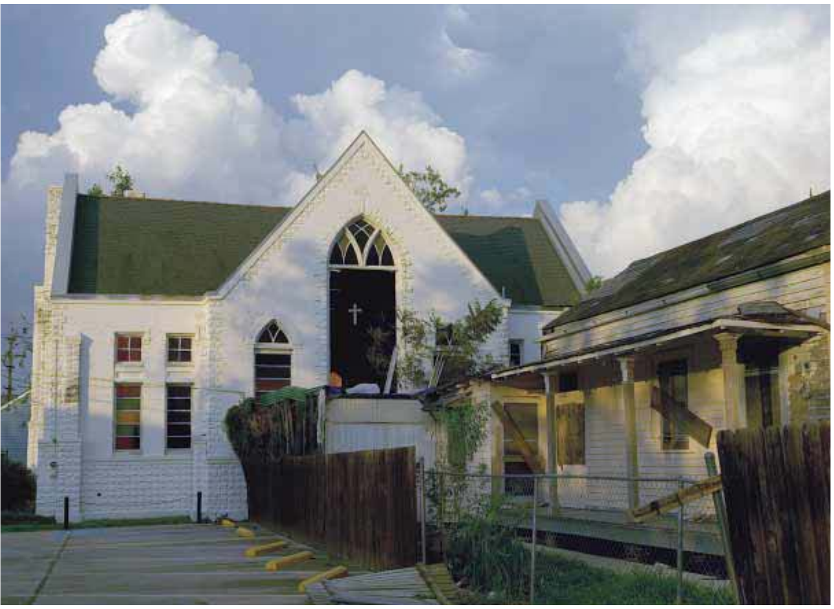
Generations of artists and photographers have documented the sensory wealth of New Orleans, including Edgar Degas, Clarence John Laughlin, and Henri Cartier-Bresson, but few have weathered a hurricane there and lived to share their imagery. While many in the Crescent City rushed to escape Katrina's advancing winds, local architectural photographer Neil Alexander remained battened down in his house near Coliseum Square, then caught a series of images—at once terrifying and beautiful—that capture the city's green and drowning essence.



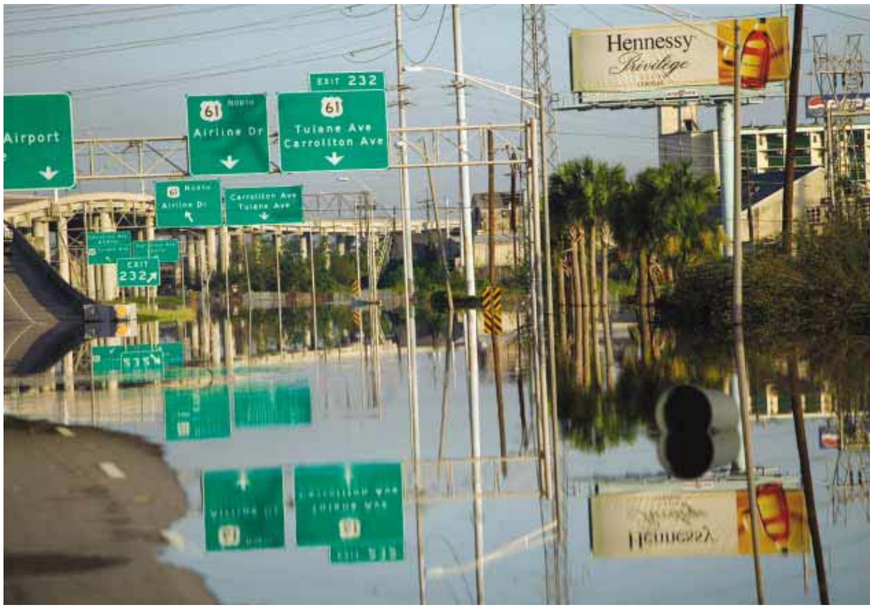
A 19th-century residence on Coliseum Square the afternoon of the hurricane.



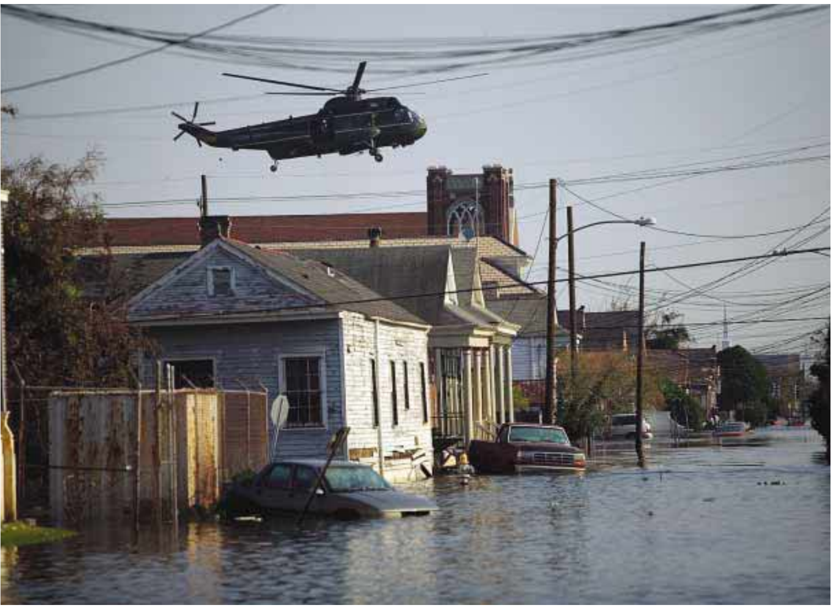
The open-air French Market after Katrina. It had been slated for restoration.



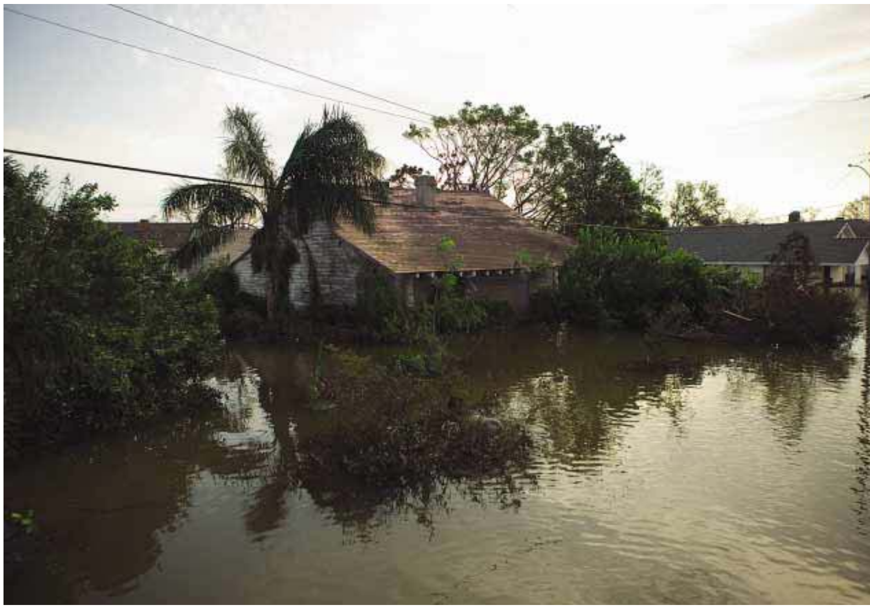
A Baptist church in Uptown lost most of its stained-glass windows.


Airport
61 North Airline Dr
Exit 232
61 Tulane Ave Carrollton Ave
Hennessy Privilege

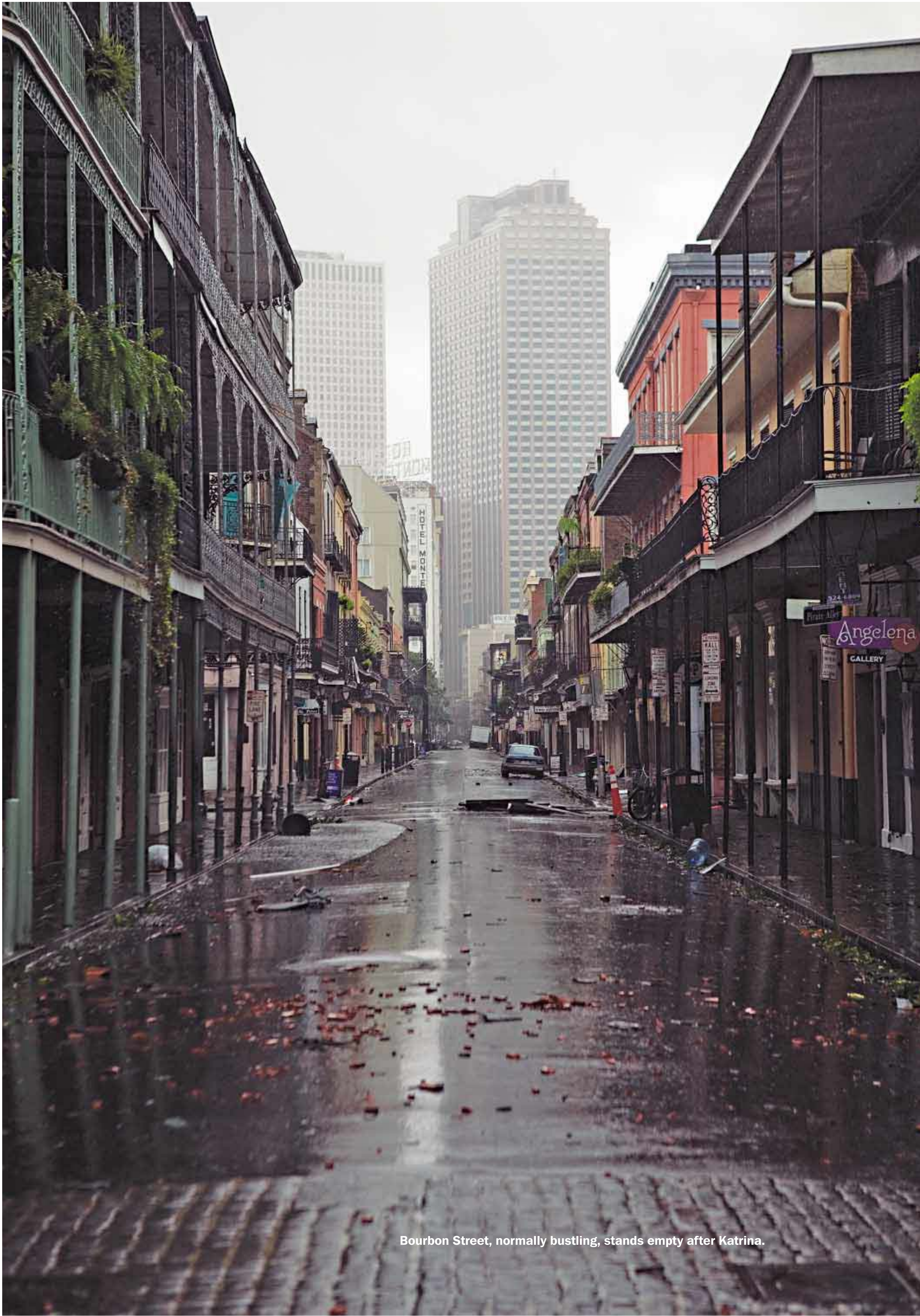
The rising tide, as seen near Carrollton Avenue and Xavier University.



A helicopter rescues residents on St. Claude Avenue.



A bungalow in the Ninth Ward, which fell victim to a nearby canal breach.

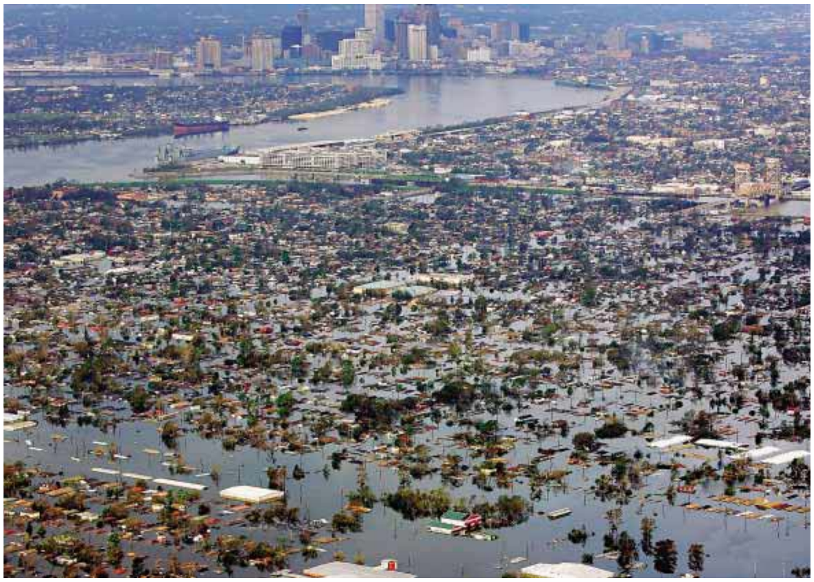

HOTEL MONTE
Pirate Alley
Angelena
GALLERY

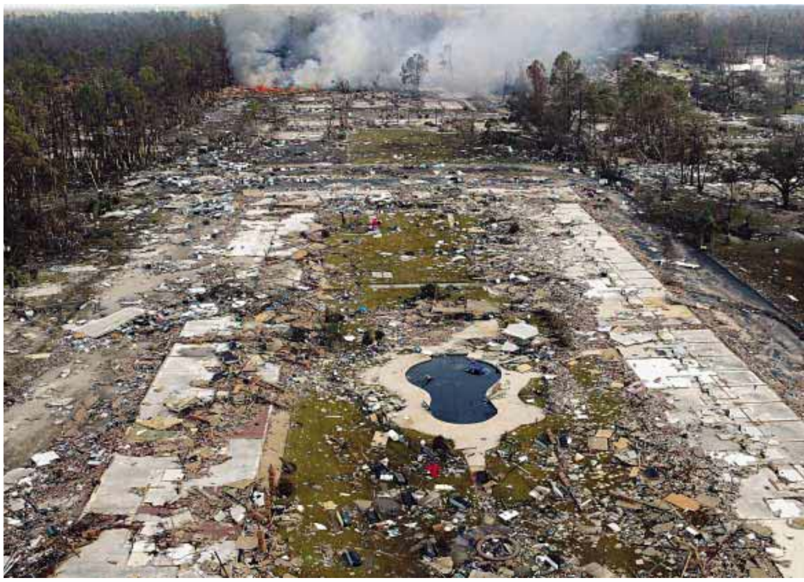
Bourbon Street, normally bustling, stands empty after Katrina.

Record News

Highlights
p.44 **Firms and schools getting back on track**
p.46 **Baton Rouge plans for doubled population**
p.57 **Other news**

SPECIAL REPORT: HURRICANE KATRINA





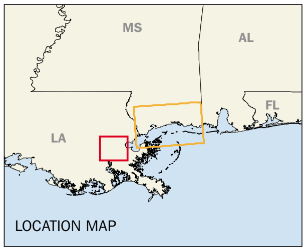
Hurricane Katrina devastates Gulf Coast region, severely compromises architectural landscape

The human tragedy weighs heaviest, but as the waters recede from the streets of New Orleans, and damage reports arrive from the Gulf Coast region, it has become apparent that Hurricane Katrina, which struck the area with devastating force on August 29, has destroyed much of its rich architectural legacy, from beautiful historic buildings to offices, riverboat casinos, and everyday homes.

As has been widely reported, the Category 4 hurricane caused several levees to breach in New Orleans, inundating upwards of 80 percent of the city, mostly in the northern sections, while tidal surges and hurricane-force winds destroyed huge sections of coastal Mississippi towns like Biloxi, Gulfport, and Waveland. Significant destruction also took place in other areas of Louisiana, Mississippi, and Alabama.

Damage figures are still only preliminary, but Risk Management Solutions, a California-based company, estimates that the storm

The storm left most of New Orleans underwater (left), and virtually wiped out towns along the Mississippi Gulf Coast, including Long Beach (above).


MS
AL
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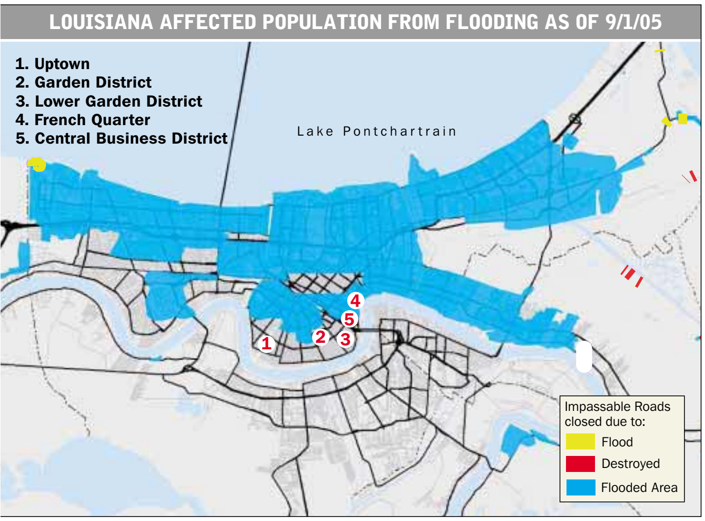
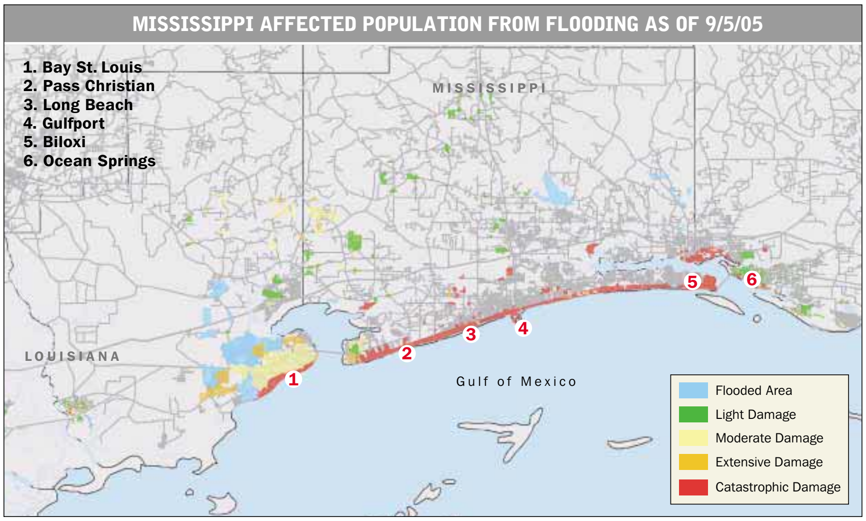
LOCATION MAP

LOUISIANA AFFECTED POPULATION FROM FLOODING AS OF 9/1/05


1. Uptown
2. Garden District
3. Lower Garden District
4. French Quarter
5. Central Business District
Lake Pontchartrain
1
2
3
4
5
Impassable Roads closed due to:
Flood
Destroyed
Flooded Area

MISSISSIPPI AFFECTED POPULATION FROM FLOODING AS OF 9/5/05


1. Bay St. Louis
2. Pass Christian
3. Long Beach
4. Gulfport
5. Biloxi
6. Ocean Springs
MISSISSIPPI
LOUISIANA
Gulf of Mexico
1
2
3
4
5
6
Flooded Area
Light Damage
Moderate Damage
Extensive Damage
Catastrophic Damage

IMAGES: © THE ASSOCIATED PRESS (TOP TWO); COURTESY FEDERAL EMERGENCY MANAGEMENT AGENCY (BOTTOM TWO)

The copper roof was torn off New Orleans's 1835 Mint building (above). More damage reports are listed on page 48.

caused about $75 billion in total property damage. While assessment is far from complete, most experts have estimated that many buildings in the hardest hit areas will have to be torn down, due to structural and environmental damage. (For a closer look at what might be salvaged, see Tech Briefs, page 191.) The National Association of Realtors claims that a minimum of 200,000 homes have been lost in the region. It predicts that most flooded homes will have to be rebuilt, including about 80 percent of homes in New Orleans. (U.S. Army Corps of Engineers Colonel Richard Wagenaar says that 160,000 houses will have to be replaced in Orleans Parish alone.) According to the Federal Emergency Management Agency (FEMA), as of September 1, more than 211,000 households were affected in New Orleans, and by September 4, over 38,000 households were affected in Mississippi.

"It's as bad or worse than what even the news is showing," says Jim West, dean of the School of Architecture at Mississippi State University, in Starkville, north of the coastal areas. He has talked to several students with families in Gulfport and surrounding towns confirming that any buildings within about a quarter mile of the beach are almost entirely gone.

The price paid by significant structures The region is one of the most architecturally rich in the United States, with thousands of buildings on historic registers, and the toll on these buildings appears high.

John Hildreth, director of the National Trust for Historic Preservation's southern office, has received very preliminary reports from around the region. He notes that the city's French Quarter and Garden District, on higher ground, appear to be relatively intact, but historic neighborhoods like the 9th Ward, Midtown, and the Treme were all badly hit. These neighborhoods, like the French Quarter, include some multistory French and Spanish colonial buildings, but contain many more single-story, wood-frame buildings from the 19th and early 20th centuries. Styles include Shotgun, Camelback, Raised Cottage, Bungalow, Mission, and Victorian. Pat Duncan, an architectural historian at the Louisiana Division of Historic Preservation, says that at least 10 of the city's historic districts appear to have experienced serious flooding. New Orleans, says the division's director, Jonathan Fricker, has more than 37,000 properties that are part of registered historic districts. Some of the city's famed above-ground cemeteries have been inundated; the Neoclassical-style New Orleans Mint, built in 1838, had its copper roof torn off; and the Louisiana State Museum in Jackson Square was also affected by flooding, but not as dramatically. "New Orleans is so rich with historic places," says Hildreth. "It's always amazing to me how extensive the historic resources were. Even in neighborhoods that tourists have never heard of." More conclusive destruction tallies will likely be ready in the coming weeks, as waters recede, says Patricia Gay, executive director of the Preservation Resource Center of New Orleans.

Richard Cawthon, chief architectural historian of the Mississippi Office of Historic Preservation, says that assessment teams of engineers, architects, and preservationists have just begun to enter the Mississippi Gulf Coast region. He predicts that 250 or more historic properties in the state may have been significantly damaged or destroyed, including entire historic districts on the coast, such as Bay St. Louis, Pass Christian, and Ocean Springs. The areas have an eclectic range of building styles, including Greek Revival, Victorian, Queen Anne, Colonial Revival, Crescent, Plantation, and several vernacular styles. Damaged icons in the area include Beauvoir, Jefferson Davis's retirement home in Biloxi, which has seen significant damage but is still standing. The Greek Revival raised cottage, where Davis originally took refuge after the Civil War, was built in the 1850s. Also, in Ocean Springs, the Louis Sullivan bungalow is all but destroyed, and the Charnley bungalow is badly damaged. (Both buildings are attributed to Sullivan and Frank Lloyd Wright.) Sullivan's simple, raised cottage, built in the early 1890s, was surrounded by lush vegetation, providing respite for the architect. In 1905, ARCHITECTURAL RECORD called the Sullivan bungalow a "modest, comfortable one-story cottage, reached only by the touch of the wind and the golden sun." Frank Gehry's $30 million, five-building Ohr-O'Keefe Museum of Art complex in Biloxi, Mississippi, which was scheduled to open next July, also suffered. A floating casino barge dislodged and landed on the site, apparently destroying three of the five pavilions, which had been in various stages of construction.

The National Conference of State Historic Preservation Officers has taken charge of coordinating historic preservation offices in the three affected states. FEMA, the National Trust for Historic Preservation, the World Monuments Fund, and the AIA, are also preparing to send assessment teams. *Sam Lubell, with Alex Ulam and Diana Lind*

Response shifts to rebuilding and heritage

In the immediate aftermath of Hurricane Katrina, the government and nonprofit community's reaction involved immediate human needs. But the response is quickly moving toward long-term rebuilding, with a large emphasis on saving historic structures.

On September 2 and 8, Congress appropriated first $10.5 billion and then $51.8 billion to feed and house victims, rebuild schools, bridges, and roads, provide medicine and services, and clear out rubble. Most went to FEMA, the Department of Defense, and the Army Corps of Engineers. The Bush administration's rebuilding efforts have included four $100 million contracts to construct emergency housing (see story on page 46).

Setting its rebuilding agenda, the AIA has specified several legislative proposals, including a $50 million federal grant program to fund "New Community" demonstration projects in the impacted areas; a $200 million "21st Century Schools" grant to provide new and repaired educational facilities in the region; incentives to clean up and redevelop contaminated brownfield sites; and federal grants for planning directed by local citizens and governments, with involvement from architects and planners.

To help protect historic structures, the Heritage Emergency National Task Force, a coalition of 40 nonprofit, professional, and government agencies, including FEMA, the AIA, The National Trust for Historic Preservation, and the National Park Service, has formed a Katrina response group. The group has begun drafting proposed legislation calling for owners of houses listed on the National Register or lying within a National Register historic district to get a 30 percent tax credit on qualified rehabilitation costs. The group has also worked on a plan for a direct grant-in-aid approach that would be administered through the region's historic preservation officers. The group aims to include preservation officers on damage assessment teams, and to prevent any unneeded destruction.

"It's important that historic buildings don't get red-tagged for unnecessary demolition," says Nancy Schamu, executive director of the National Conference of State Historic Preservation Officers. ***Allen Freeman***

PHOTOGRAPHY: © NEIL ALEXANDER

SPECIAL REPORT: HURRICANE KATRINA

Architecture firms in Gulf Coast region struggle to find footing

Weeks after Hurricane Katrina, the biggest issue for architects in New Orleans and the Gulf Coast region was still communication.

“Being totally cut off from people has been the worst part,” says Jerry Billis, AIA, of Billis Architecture, a New Orleans firm of nine. Billis, who first borrowed office space from Baton Rouge–based Trahan Architects, has now leased space in Baton Rouge. He anticipates staying for six months to a year.

The impact on firms ranges from tiny to catastrophic. Angela O’Byrne, AIA, president of the AIA New Orleans Chapter and Perez Associates, which is setting up shop in Baton Rouge, notes, “Our projects are underwater, and our clients are scattered.” Blitch Knevel’s offices in New Orleans were undamaged, but firm principal Ron Blitch, FAIA, has been frustrated by lack of access to bank accounts, mail, and basic communications.

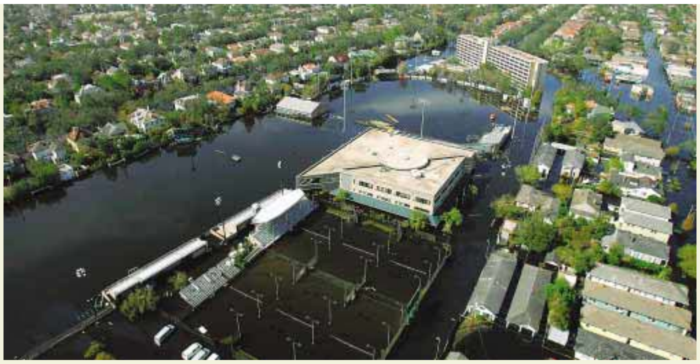
Steve Dumez, AIA, of New Orleans–based Eskew Dumez Ripple, has also leaned on Trahan’s office, and notes it took his firm 10 days to find everyone. The partners quickly set up in Baton Rouge, purchasing homes for themselves and their staff and leasing office space. Their New Orleans office sustained little damage, but many lost their homes, and it will be some time before others can move back. Many details remain uncertain, including which staff will stay on. Dumez estimates a 50 percent loss in terms of ongoing work, but realizes that not all local firms have clients beyond New Orleans. Every tally of damage, it seems, is coupled by the “we-were-luckier-than-some” rejoinder.

Lynn Robertson, executive director of AIA Louisiana, says that a third of the state’s AIA membership is New Orleans based, with some 350 architects in 87 firms. Most large firms, she says, have relocated to Baton Rouge and elsewhere in the state, but “many others still have not called us.”

Victor “Trey” Trahan, AIA, principal at Trahan Architects, says that Baton Rouge firms are doing what they can for their New Orleans colleagues. “The smallest thing—use of a computer, introduction to a banker—means everything to them right now,” he says. “As architects, we are very competitive with each other, and now that just does not matter in the same way.” Other local firms hosting New Orleans counterparts include Post Architects (hosting Blitch Knevel Architects) and Ford/Dickinson (hosting Wayne Troyer, AIA’s firm). Nationally, the AIA has established the “Displaced Architects Fund” to accept donations for architects; it has created an online registry for architects to request tools; and it is providing an online service to link local architects with those offering positions or space.

Most firms are eager to get back to New Orleans. “We have clients who are pushing forward with local projects, and we are responding,” says Troyer. “Beyond that, we are all trying to think about what socially conscious revitalization can come from this.” *Kira L. Gould*

Hurricane-affected architecture schools getting plenty of help



Thousands were uprooted by Hurricane Katrina, including more than 350 students at Tulane University’s School of Architecture (damage to Tulane is pictured at right). After Tulane officially canceled the fall semester on September 2, these students began a scramble to re-enroll elsewhere.

For Dean Reed Kroloff, the first challenge was finding them. With student and faculty records lists down, he and Associate Dean Ila Berman used e-mail, the Web, and telephones to track down students. Kroloff’s thoughts then turned to keeping fifth-year students together for the first semester of their last year. In what is likely the largest block of students relocated to a single institution, more than 30 fifth-year students are enrolling at Arizona State University (ASU), where five Tulane faculty members will teach. ASU Dean Wellington “Duke” Reiter earned his bachelor’s degree at Tulane, and Kroloff has long had a close relationship with ASU. Local architecture and construction firms—including Architekton, Gould Evans, and McCarthy Building Companies—donated time and materials to get studio space at the ASU Foundation building (below) ready. Kroloff is enthusiastic about the Tulane-in-exile experiment. “This presents an opportunity for true pedagogical innovation,” he says. “We have been planning curricular changes, and this will ramp up that transformation. We are looking at how to recast architecture as a significant force in public service and leadership.”

Schools throughout the country have offered to host displaced students from Tulane and other New Orleans–area universities. Students are enrolled as visiting students rather than as transfers, and will pay tuition to their home institutions, where they are expected to return in the spring. Nearby, several undergraduates have registered at Mississippi State University and Louisiana State University. Students have also found their way to the University of Texas-Arlington, Georgia Tech, Cornell, Pratt, Columbia, Syracuse, Cooper Union, the University of Pennsylvania, the University of Southern California, Sci-Arc, Cal Poly-San Luis Obispo, and others.

Still, challenges remain. Holly Latter, one of several students enrolled at Parsons School of Design in New York, knows Tulane wants her back for the spring semester, but she is skeptical about the shuffle in her last year, and about whether Tulane will be operational. More immediately, a single-semester stint presents a housing challenge, especially in New York City. But amid uncertainty, she’s digging into course work. Adam Porter, a fourth-year Tulane student from Warrenton, Virginia, started classes at the University of Virginia without his supplies and computer, the conditions of which he is uncertain. But he is sure that he will return to Tulane. “I’ll definitely be back in the spring,” he says. “There are going to be a lot of opportunities for our trade in the coming years in New Orleans, so now I’m considering staying in the city after graduation.” *K.G.*

PHOTOGRAPHY: © BILL TIMMERMAN (BOTTOM); © THE ASSOCIATED PRESS (RIGHT)

Architects and planners weigh in on rebuilding New Orleans

New Orleans is, by American standards, an ancient city with a declining economy. The population shrank by 150,000 from 1960 to 2000, and 28 percent lived below the poverty level. Many energy-corporation headquarters have moved away. Its location below sea level raises the possibility that another catastrophic flood could hit the city. Yet the suggestion among some that New Orleans should be abandoned has met with fierce opposition. Most who cherish it for its cultural legacy and its place in the nation's economy, especially due to its ports, want to concentrate instead on effective rebuilding. Many questions remain unanswered, not least being how reconstruction can help turn around the city's economic fortunes, and how important architecture can be saved. Here's what several designers have to say.

"Rebuilding New Orleans can prove that America has values instead of just weapons. Mayor Ray Nagin and others need to form a housing committee to assess the situation. Residential buildings in the CBD [Central Business District] that can house a lot of people should be built first. I think a lot of the neighborhood housing can be salvaged. There's so much of it, and the wood is 150 years old in some cases; it's not going to warp like modern framing."

—HUGH HARDY, FAIA, PARTNER, H3; MEMBER, NEW YORK NEW VISIONS, A COALITION OF DESIGN PROFESSIONALS FOR REBUILDING LOWER MANHATTAN

"Given everything that New Orleans means to so many people—the mythology, the culture, the architecture, the spirit of the place—it's shocking to think of not rebuilding. We're casting about now, trying to establish groups, looking at 9/11 and other models. After Hugo hit Charleston in 1989, Mayor Joseph P. Riley was able to establish a design task force. He was a leader with a vision of what was possible; he established clear priorities."

—STEVE DUMEZ, AIA, ESKEW+DUMEZ+RIPPLE; PAST PRESIDENT, AIA LOUISIANA AND AIA NEW ORLEANS

"There's a massive amount that will have to be rebuilt. It may be that many neighborhoods won't come back. Haste will create a tendency to build back below current building codes. That's a disaster waiting to happen. There will have to be planning to get easy access in and out of town. There will be political pressure to rebuild right, and I think there'll be money for planning. Nobody's going to want to go through this agony again. Hurricanes are two, three times as frequent as in the '70s."

—TERRANCE BROWN, FAIA, ASCG INCORPORATED, ALBUQUERQUE, N.MEX.; COCHAIR, AIA DISASTER ASSISTANCE PROGRAM

"You need a broad-based planning process, with neighborhood input, even while infrastructure is being rebuilt. Transit-oriented development could mitigate some of the problems we saw in the disaster."

—ERNEST HUTTON, ASSOC. AIA, HUTTON ASSOCIATES; COCHAIR, NEW YORK NEW VISIONS

"I think it will be a smaller city. It's a very important port city, and that is something that should be preserved. My concern is that New Orleans doesn't become a Disney World. I hope we don't try to replicate what was there with new technology and products. Rebuilding is going to take a huge workforce, and I worry about where the workers can live. So little livable housing remains. The west side of the Mississippi is all marshes and bayous and lakes; there are so few buildable areas.

—SKIPPER POST, FAIA, POST ARCHITECTS; PAST PRESIDENT, AIA NEW ORLEANS

"I'm halfway between skeptical and cynical. In New Orleans there's no city left, no public to get involved in the rebuilding, and at the end of the day, it's all about process. What we learned from Lower Manhattan is follow the money. Politics trumps good intentions. With the number of property owners and insurance issues in New Orleans, there will be an infinite number of hoops to jump through if you hope to improve on what was there before."

—MARGARET HELFAND, FAIA, MARGARET HELFAND ARCHITECTS; FOUNDER, NEW YORK NEW VISIONS

"We should take a regional approach, preconditioning what we do with New Orleans on what we do with Baton Rouge and Morgan City. The physical, social, and economic conditions have to be looked at as a system. You can't bring back a single district, like the French Quarter, without homes and communities for workers. There will need to be a system of housing subsidies to make homeownership affordable. After disasters, modest opportunities typically are seized upon, but visionary schemes are ignored."

—LANCE BROWN, FAIA, LANCE JAY BROWN ARCHITECTURE + URBAN DESIGN; COCHAIR, DISASTER PREPAREDNESS TASK FORCE, AIA N.Y.

Canal Street in downtown New Orleans, after Katrina.

PHOTOGRAPHY: © REUTERS/JASON REED

"In a place as polarized as New Orleans, it will be important to open the design process. The tragedy is that unless you change the fundamentals, you're going to end up with something worse than before. Today's temporary housing will be the substandard housing of tomorrow."

—ROBERT YARO, PRESIDENT, REGIONAL PLAN ASSOCIATION, NEW YORK

"We want to fight for quality decision making, based on best practices and a planning ethic stressing social justice … this is the loss of our community, our culture, our music. It would be a continuation of tragedy if Katrina ends in decanting poor people out of New Orleans and disconnecting them from their roots. There's already a surge to rebuild by the heavy engineering companies. We're afraid that by the time people catch their breath and look up, we might have already lost the golden moment to put triage in place and make the right moves."

—ALLEN ESKEW, FAIA, ESKEW+DUMEZ+RIPPLE, NEW ORLEANS

"Like many, I fear the insurance company penchant for demolition. Perhaps write-offs will save paperwork and clerical labor, but what is at stake is an urban model that is unique to our country that should not be lost. These narrow, fragile buildings are tougher than they look and are the residential fabric of a city, which is alone in our country in the type of city life it contains and nurtures. Let's rebuild, anew, if necessary, but for the most part by simply drying out and moving in. We should not worry about the clean up; patina is a given in this humid climate."

—ERROL BARRON, FAIA, ERROL BARRON/MICHAEL TOUPS ARCHITECTS, NEW ORLEANS; FAVROT PROFESSOR OF ARCHITECTURE, TULANE UNIVERSITY

SPECIAL REPORT: HURRICANE KATRINA

FEMA orders temporary housing units; experts worry about their permanence

After scattering around the country and being placed in emergency shelters, hurricane evacuees are now in need of more permanent housing.

The Federal Emergency Management Agency (FEMA) has ordered 100,000 two-bedroom mobile homes and recreational vehicles from manufacturers across the country to house an estimated 300,000 evacuees, says James McIntyre, a FEMA spokesman in Baton Rouge, Louisiana. They expect to order an additional 200,000 units, with approximately 30,000 units opening per week, which may house people for two to five years. Bechtel National, Fluor, Shaw Group, and CH2M HILL Companies were all awarded FEMA contracts under what FEMA called a "limited competition," essentially no-bid arrangements that assure predetermined profits.

Some have indicated that decommissioned military bases may be used for the trailer parks, and *Engineering News Record* reports that FEMA is also considering using United States Department of Agriculture campground sites. The units will be deployed to these sites from four staging areas in Texas, Mississippi, Alabama, and Louisiana.

Critics in Congress, including House Minority Leader Nancy Pelosi (D-California), contend that the no-bid contracts, similar to the ones used to rebuild Iraq, lack incentive to control costs. (A FEMA spokesman said the agency has the experience to make sure the money is efficiently spent.) Meanwhile, the site selection, arrangement, and infrastructure surrounding these units concerns the AIA "because temporary housing has a tendency to become permanent," says Ann Somers, of AIA Mississippi. A statement released by the AIA national component notes, "Actions taken now have long-term consequences, and important principles should be adhered to from the beginning." It continues: "Regardless of a transitional or permanent housing arrangement, there are fundamental design elements that are essential to the construction of a 'livable community.' There will be a need for privacy, convenience, retail, open space, recreational facilities, and entertainment so that residents can develop of a 'sense of place.' "

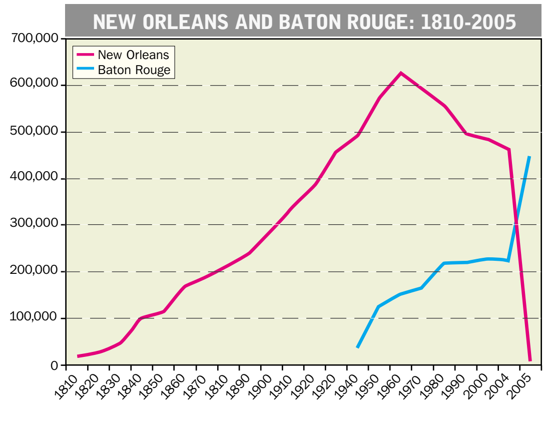
Mary Comerio, a professor of architecture at the University of California, Berkeley who has studied disaster recovery, agrees, noting, "The U.S. is facing a situation similar to what many developing countries have faced after massive disasters: how to house large displaced populations. The solution is often to lay down as many units of housing, in a grid, as quickly as possible. This is great for politicians and terrible for the people who end up living there." *Alan G. Brake, with reporting by Tony Illia*

OVERSIZE LOAD
GMC

FEMA-sponsored housing units, by Clayton, roll into the Gulf Coast area.

Its population doubled, Baton Rouge is forced to adjust urban planning

Baton Rouge became the largest city in Louisiana overnight, when evacuees fleeing Hurricane Katrina ballooned the area's population from roughly 400,000 to 800,000, according to Walter Monsour, the city's chief administrative officer. Becoming a first-tier city in a single day has resulted in commune-style living, depleted store shelves, and overburdened phone lines and traffic lanes.


NEW ORLEANS AND BATON ROUGE: 1810-2005

Meanwhile, officials are still trying to get a handle on urban planning, infrastructure, and housing issues. Monsour is coordinating a group of business leaders and elected officials to identify the city's future needs, including planning new zones for development and building a bigger airport, new traffic loops, and an enhanced transit system. "We intend to hire the best urban planner in the country that we can get our hands on to come in and replan," he says. Baton Rouge–based architect Trey Trahan says he has been asked by the city to put together "an international team of thinkers—including Arup, Urban Strategies, and Michael van Valkenburgh" to address such issues.

Because available real estate has been virtually bought out, officials are trying to plan a city that will accommodate the still-growing populace. While no new zones have been chosen for permanent development, Monsour says that the city is looking at refurbishing three or four areas. The process must be undertaken "judiciously," he says, "so as not to eliminate one problem and create another." He adds: "Some pockets will be easier for communities to absorb, and we don't want to clog any particular area." He notes that the city has a number of lots that were being considered for development prior to the storm; construction on them will be starting very soon.

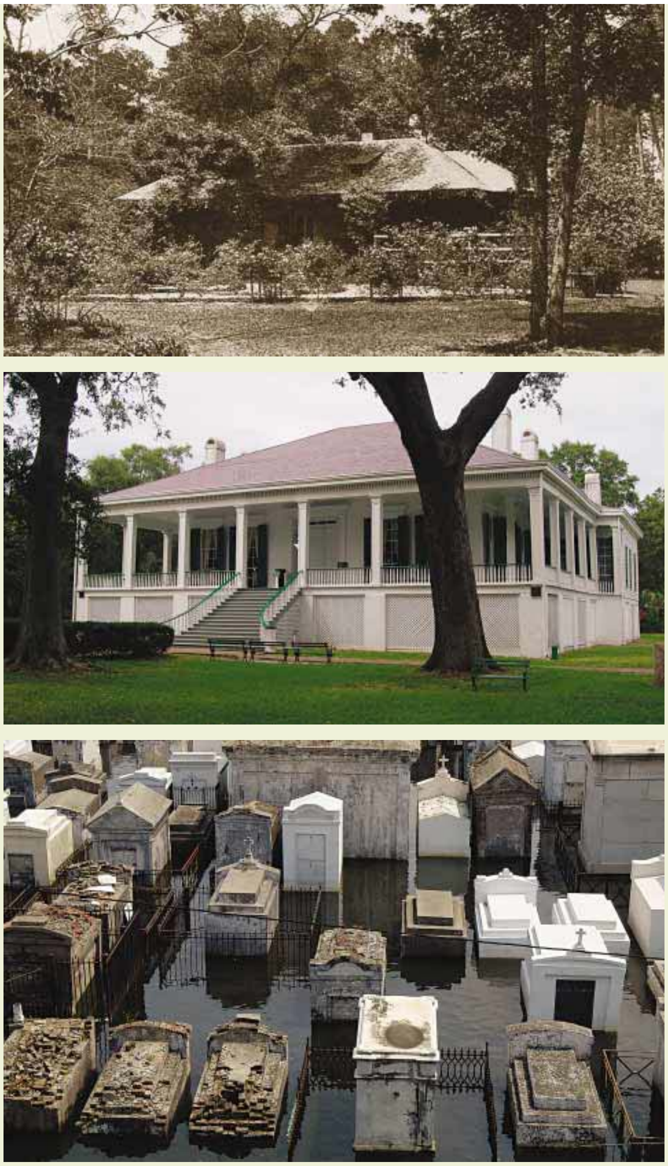
FEMA will be "picking up the tab" for those in shelters and mobile homes, and those living with family and friends, Monsour says. He expects the U.S. Department of Housing and Urban Development to sustain housing after some time.

Meanwhile, city planners are hoping to make the best of an unprecedented opportunity to bring back blighted neighborhoods, Monsour says. Affordable housing, specifically for the displaced poor, is the largest need in Baton Rouge, says Dr. Sally Soileau, a Louisiana Cooperative Extension Service agent. Limited spaces are available in public housing, but evacuees have even filled up student housing and 4-H camps.

Arthur Sterbcow, president of New Orleans–based Latter & Blum Realtors, predicts that the immediate surge of home sales in Baton Rouge will slow down when residents return to surrounding areas. But "there will still be a tremendous demand for housing in the Baton Rouge area because it will be a staging area for the rebuilding of New Orleans," Sterbcow says. *Angelle Bergeron*

PHOTOGRAPHY: COURTESY FEDERAL EMERGENCY MANAGEMENT AGENCY (TOP)

SPECIAL REPORT: HURRICANE KATRINA



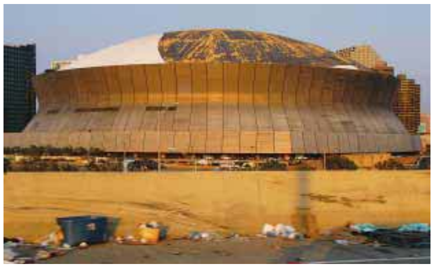
Damaged architectural treasures

Assessments have just begun, but according to preservation officers, in Ocean Springs, Mississippi, the Louis Sullivan bungalow (top, prestorm) was all but destroyed, and the Charnley bungalow was badly damaged. Beauvoir, Jefferson Davis's raised-cottage-style home (center, prestorm) in Biloxi, Mississippi, sustained severe roof and porch damage. Significant damage was also sustained by some of New Orleans's raised cemeteries (above), and a wayward casino barge destroyed much of Frank Gehry's under-construction Ohr-O'Keefe Museum of Art in Biloxi. The Neoclassical Mint in New Orleans lost its copper roof, and the Greek Revival Tullis-Toledano Manor and raised-cottage-style Dantzler House in Biloxi have been reported destroyed. The Old Capitol Museum of Mississippi History in Jackson, Mississippi, also lost much of its roof. ***S.L.***

Now infamous, Superdome once stood as a great New Orleans landmark

The Louisiana Superdome, where thousands sought shelter from Hurricane Katrina last month, stands damaged with parts of its roof torn off. Some politicians have said the structure should be torn down, but at press time the decision to demolish, repair, or rebuild it awaited evaluation.

Whatever its fate, the Superdome has been a remarkably versatile monument that stayed under the radar of the design press. That may be due to its strange exterior, which resembles a Jupiter-scaled armored spaceship. It never received a full presentation in RECORD or other national magazines when it was completed in 1975, despite being a landmark project in many respects.



The Superdome suffered severe roof damage.

Ironically, the Superdome was designed by Louisiana's most heralded firm of the time, Curtis & Davis, which carved out a successful Modernist practice in a city where nostalgia hangs in the air like Spanish moss. The firm won five national AIA awards in the 1950s, and set up branches in New York, Los Angeles, London, and Berlin.

The Superdome was as closely linked to Houston's Astrodome at its conception as it was last month, when refugees were transported from Louisiana to Texas. A year after the Astrodome's 1965 opening, Louisiana authorized the project that would trump Houston's self-described “eighth wonder of the world.” Construction began in 1971 and took four years and between $134 and $173 million to complete, compared to the Astrodome's $35 million. It was the world's biggest building of its type, a 125-million-cubic-foot space with a capacity of 100,000 enclosed by a 273-foot-high dome spanning 680 feet. Like the Astrodome, the Superdome has a steel lamella roof, but it is opaque rather than transparent. Its seating plan, a bulging square, has been dubbed a “squircle.” Conversion from one function to another was effected by movable stands with a seating capacity of 15,000 each, reached by six movable bridges.

The stadium has played host to six Super Bowl games, in addition to being the home of the New Orleans Saints, Tulane's Green Wave football team, and the NCAA Sugar Bowl. It's also housed two NBA basketball franchises, four NCAA Final Four tournaments, a Papal visit, a Republican National Convention, and the biggest indoor rock concert in history, a Rolling Stones show in 1981, attended by 87,500 people.

Construction on the stadium was completed in 1975.

The Superdome had previously served as a hurricane shelter in 1994 and 1998, but many now seem to see it as the physical manifestation of the government's failure to act quickly to protect New Orleans's poorest residents from the post-Katrina floods. Politics aside, two of its greatest strengths—its functionalism and its fixed roof—may count against its fate. Multipurpose stadiums are passé, displaced by pricier aggregations of single-use venues. Likewise, fixed roofs have been upstaged by more costly retractable ones, and the Saints were demanding a retractable roof venue even before Katrina hit. *John Pastier*

PHOTOGRAPHY: © ARCHITECTURAL RECORD (TOP LEFT); COURTESY MISSISSIPPI HERITAGE PRESERVATION (MIDDLE LEFT); FEDERAL EMERGENCY MANAGEMENT AGENCY (BOTTOM LEFT AND TOP RIGHT); © ENGINEERING NEWS RECORD (BOTTOM RIGHT)

"Crescent of Embrace" chosen for Flight 93 Memorial design

Organizers of the Flight 93 National Memorial, dedicated to the 40 passengers and crew of a United Airlines flight who lost their lives on September 11, 2001, gathered in Washington, D.C., on September 7 to announce the selected design. "Crescent of Embrace," by Paul Murdoch Architects of Los Angeles, California, with Nelson Byrd Woltz Landscape Architects of Charlottesville, Virginia, was selected from among five finalists.

The announcement marked the conclusion of a one-year competition, a first for the National Park Service, which oversaw the selection. A 15-member jury made up of design professionals, community leaders, and family members selected the design; the memorial will be located in Shanksville, Pennsylvania, where the flight crashed in an open field. The design will now be submitted to the Secretary of the Interior for approval.

The title of the design, "Crescent of Embrace," refers to a central element in the memorial—a curving landform that formally reinforces the naturally occurring bowl-shaped topography surrounding the crash site. An allée of red maple trees that is flanked by 40 tightly arranged groves of sugar and red maples forms a landscaped zone that protects the bowl while forming a walkway leading to the crash site.

Other design elements include the "Tower of Voices," a concrete structure with 40 white aluminum wind chimes located at the entrance to the memorial, and a black slate plaza at the "sacred ground," with a white marble wall along its western edge that will be inscribed with the names of the 40 victims.

In explaining the project title, Murdoch prefers to place the "emphasis on embrace—a collective gesture to bring people together within the bowl." This sentiment was echoed by officials and family members. Joanne Hanley, superintendent of the Flight 93 Memorial for the National Park Service, described the design as "a memorial that meets all of the goals of the project."

Shortly after the winning design was announced, the use of the red crescent drew criticism from some religious groups and Web sites. As noted on the conservative blog Zombietime (www.zombietime.com), "The winning design chosen to memorialize the heroes and victims of 9/11's Flight 93 is in the shape of a red crescent that looks—either accidentally or intentionally—remarkably like an Islamic crescent."

When asked about the controversy, Murdoch explained that the term "crescent" should be interpreted on a "universal level" and that it also applies as a technical, not religious, term. The jury report anticipated the possibility for misinterpretation and had recommended that the " 'Crescent' should be referred to as the 'circle' or 'arc' or other words that are not tied to specific religious iconography." While no official project timeline has been established, the goal is to complete the first phase of construction on the memorial for the 10th anniversary of 9/11. *Jennifer Lucchino*

Red maple trees will flank the area's bowl-shaped topography.

IMAGE: COURTESY NATIONAL PARK SERVICE

Herzog heads to Southampton

Swiss firm Herzog & de Meuron has landed its first East Coast commission, to design a new complex for the Parrish Art Museum in Water Mill, New York. In August, the board of trustees of the Parrish, Long Island's oldest art museum, handpicked the firm after an international search.

The new Parrish, scheduled to open in 2009, will rise on a recently purchased 14-acre site, a former landscape nursery, 2 miles from the museum's current location in the village of Southampton. The 80,000-square-foot complex will include 14,000 square feet of gallery space, enabling the museum to display more of its permanent collection, and to mount more diverse special exhibitions. The current museum building, established by Samuel Parrish in 1898, measures only 17,000 square feet.

Winners of the 2001 Pritzker, partners Jacques Herzog and Pierre de Meuron recently unveiled the Walker Art Center addition in Minneapolis [RECORD, July 2005, page 89] and the de Young museum in San Francisco. The design of these projects—along with the Tate Modern in London—led the Parrish to their door, according to museum board chairman Alvin Chereskin. Landing the architects is a coup for the modest-size museum, well-known in the art world and in the Hamptons, but not nationally. The relocation plan, to be funded by a capital campaign, trumps an earlier expansion scheme by Centerbrook Architects, whose scale had met with community opposition. Tentative plans call for the current Parrish building to operate as a satellite of the new museum, says Parrish director Trudy Kramer. ***Bill Weathersby, Jr.***

OMA designing tower in Louisville

Louisville, Kentucky's skyline, and its cultural profile, are primed to become a lot more interesting in coming years. The New York office of Rem Koolhaas's OMA is slated to build a mixed-use tower downtown, including a 40,000-square-foot contemporary art museum, student housing, office space, condominiums, and retail space.

Joshua Prince-Ramus, the lead designer of the Seattle Public Library, will lead the project, which is expected to be at least 20 stories tall. Two prominent local philanthropists, Steve Wilson and Laura Lee Brown, and a real estate developer, Steve Poe, are the forces behind the project. Wilson and Brown, who are married, are also developing a boutique hotel a block away, designed by Deborah Berke.

"My wife and I have been interested in the redevelopment of Main Street for several years now," says Wilson. "We are happy to be working with what we believe to be the best architecture firm in the world."

The site is a small parcel of land on a sloping site between Main Street and the Ohio River adjacent to an interstate highway. The new Muhammad Ali Center, designed by Beyer Blinder Belle, which will be completed this fall, is located next to the site. The project quickly gained the support of city and state government, which pleased OMA. "The more interesting work seems to be happening in red states right now, the places that 'cultured' America has written off," says Prince-Ramus. "It should be a wake-up call for the coasts." A phase-one conceptual design is expected in about six months, and the developers hope to complete the project within three years. *A.B.*

Conforming to trend, Watergate Hotel complex is becoming condos

Following a trend evidenced a few months ago when the Plaza Hotel began its transformation into condominiums, the Watergate Hotel, part of the Washington, D.C., complex made infamous by the Nixon administration's political scandals, is being transformed into condos. D.C.-based Monument Realty has chosen local firm Hickok Warner Cole Architects, with Dallas-based Forrest Perkins and Toronto-based Yabu Pushelberg, to convert the 13-story, 251-room establishment along the Potomac River into a 104-unit luxury residential co-op. The project is scheduled to open in late 2007.

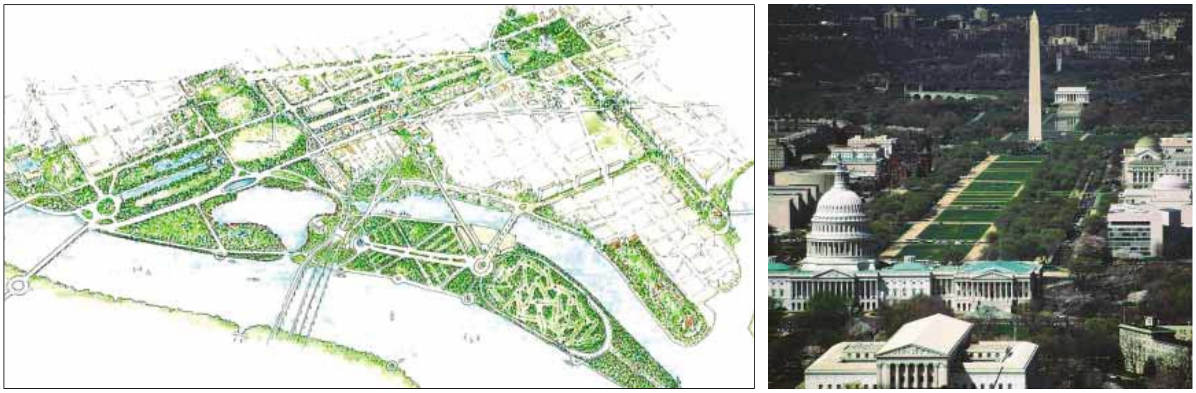
For many, *Watergate* conjures a break-in at the Democratic National Committee's headquarters (in the office building that is perpendicular to the former hotel), erased taped conversations, and a critical informant that, until recently, remained anonymous. But the legendary compound, which was completed in 1971, has another tainted association: It was designed by Luigi Moretti, the Italian architect who became a Fascist and prospered under Benito Mussolini's rule. Considered a mid-20th-century Modernist, Moretti's interest in both curves and light generated the Watergate's unique shapes and details, which engage the site's riverside edge.

Although interested in changing its use and modernizing its services, the developer asked the architects not to alter the building's exterior. Just this year, the project was placed on the District of Columbia's Inventory of Historic Sites—a move that originally grew out of local opposition to the hotel-to-residence conversion plan.

The Watergate's narrow rooms will be widened.

The interior, however, will be stripped to its concrete bones and reconfigured into ultra-high-end apartments—quite a complicated task. "We had to turn somersaults," says Frank Durkin, an associate at Hickok Warner Cole, to fit the new, expanded units into the existing 16-foot column bays, 8-foot ceiling heights, and curved curtain-wall exterior. For example, to avoid dropped ceilings, the architects specified multiple mechanical systems so that all ductwork would run vertically. This has required many penetrations within the existing 40-year-old concrete slabs. To compensate for any diminished structural capacity within the floor plates, the contractor is strengthening the area around each hole with a fiber-reinforced polymer tape, developed with carbon fibers through the nascent field of nanotechnology. Ten years ago, without this very new and highly advanced building material, "We couldn't have done this job," notes Durkin.

Durkin believes that the unique views provided by the site (all units see the river since the building is perpendicular to the Potomac) and the attention that is being paid to detailing will more than compensate for the challenges the architects face in fitting luxury housing within the existing building. *Nancy B. Solomon, AIA*


The mall as it stands now (near left). The group's plan (far left) calls for expansion to the west and the south.

Group lobbying to expand National Mall in Washington, D.C.

America's great front yard, the National Mall, was declared "a finished work of civic art" by Congress in 2003, resulting in a building moratorium along the iconic greensward lined with museums, monuments, and memorials. But a nonprofit citizens group called The National Coalition To Save Our Mall now wants to enlarge the 725-acre mall area by up to 50 percent.

"The mall was intended to be an ever-evolving, open, public space dedicated to the expression of democracy," says Judy Scott Feldman, chairman of the coalition.

The group, which has presented its plan to several congressional committees, cites the work of a 1901 commission, led by Senator James McMillan of Michigan, that extended the mall west and south of the Washington Monument, selected a site for the Lincoln Memorial, and created what became the East and West Potomac Parks. The coalition also believes a new coordinated master plan is needed to ensure the mall's survival for the next 100 years. Mall management is currently divided among six separate government agencies, each with conflicting agendas, the group claims.

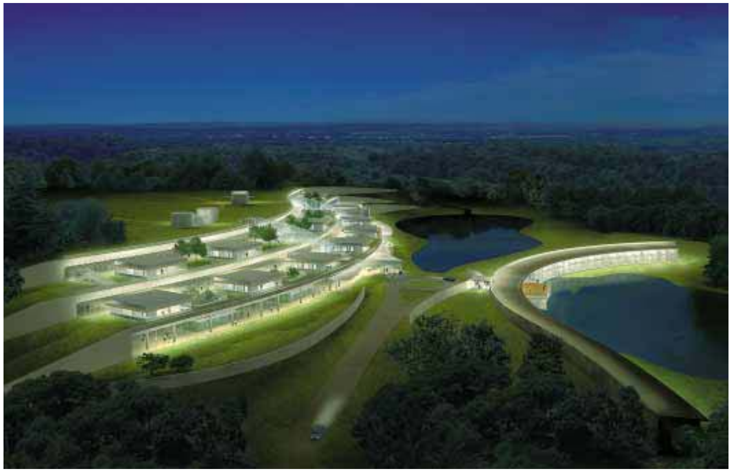
Its proposed plan would extend the mall from the Lincoln Memorial three miles along the waterfront to East Potomac Park's Hains Point; create a spur from the Capitol down South Capitol Street; and add pedestrian, bicycle, and vehicle links to the sites, along with a brief span over Virginia's Potomac River bank. It would also create room for 51 memorial projects and four major museums.

Not everyone agrees with the idea. "We defined and completed the mall in 2003," responds John V. Cogbill III, National Capital Planning Commission chairman. "The mall has fixed boundaries. That's where we have a philosophical difference with this plan. I think we need to take the concepts and expand in other areas."

But existing plans to scatter memorials across the city only isolate and dilute the mall's relevance, Feldman believes, while an increased mall would boost its historical and cultural value. The National Park Service, meanwhile, is planning to draft a broad management plan next spring in response to the coalition. *Tony Illia*

IMAGES: COURTESY HICKOK WARNER COLE ARCHITECTS (TOP); NATIONAL COALITION TO SAVE OUR MALL (BOTTOM)

Record News On the Boards: Landform



The new, 610,000-square-foot campus is being built into a bluff.

Howard Hughes Medical Institute's newest complex built into hillside

Rafael Viñoly Architects is close to completing an ambitious new research campus for the Howard Hughes Medical Institute, a nonprofit biomedical research and funding organization started by its namesake, the late eccentric aircraft magnate Howard Hughes.

The 610,000-square-foot Janelia Farm Research Campus in Ashburn, Virginia, will have an undulating shape, conforming to the topography of the site, a sloping bluff overlooking the Potomac River. The center will be marked by three descending planted terraces, under which will sit labs and support spaces. The main entrance will be on the lowest level, opposite two small ponds and the distant river.

The structure, a hybrid of steel and concrete, is "trying to establish a dialogue with this bluff location," says Jay Bargmann, AIA, the firm's vice president. He adds, "We didn't want to place a series of boxes across this meadow, and we didn't want to bury it. We made the building part of the hillside."

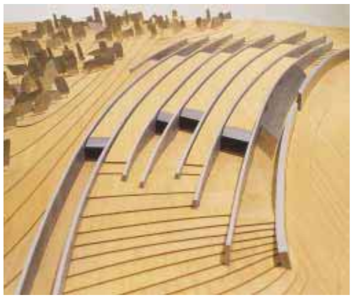
Each group of scientists will have its own glazed pod, measuring about 45 by 45 feet, and housing offices, work areas, meeting rooms, and communal spaces. The 15 pods will have distinctive, projecting formations, and joining them will be 90-foot-long, floor-to-ceiling glazed horizontal circulation corridors, and two perpendicular stairs under vaulted glass roofs, which divide the complex into thirds. A large conference center with dining, auditoriums, an art gallery, and a library, will be situated on the ground floor.

The building's glazed walls and the top floor's glazed ceiling will allow light to penetrate the labs, while all mechanical systems will be placed deep into the ground. The $243 million project is set to be completed in mid-2006. *S.L.*

New Stonehenge visitors center to become "landscape, not landmark"

The prehistoric ruin of Stonehenge in southwest England is to be rescued from the increasing traffic around it and reunited with its surrounding monuments and landscape.

U.K.-based Denton Corker Marshall (DCM) is designing a nearby visitors center and interpretive museum for the oft-visited circle of stone pylons and lintels, which was built between 3,000 and 1,600 B.C. and hosts more than 750,000 visitors each year. The center will replace the site's cramped visitor/information facilities, and will be positioned a little less than 2 miles from the site.



The architects note that the 18,000-square-foot center's design, which is awaiting planning approval, will be a "landscape rather than a landmark," deferential to its context. Barrie Marshall, chief architect at DCM, says that it will appear as an "elemental, timeless sculptural form in the landscape," with long, sweeping, metal-clad walls, broken only by a single gap in its surface, through which visitors will enter.

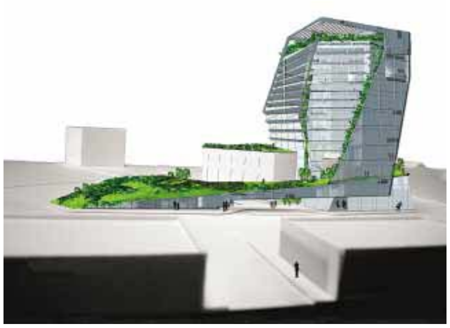
In addition to sharing the mysterious history of Stonehenge, and informing visitors about its environs, the building will house educational facilities, a café, and a shop. In the new layout, a visit to the site will begin at the visitor center. The site is surrounded by one of the largest chalk landscapes in the U.K., which will be created anew around the stones, while much of the surrounding farmlands will be reverted to pasture.

The project is a joint scheme of the national and local government, the British Highways Agency, Britain's National Trust and English Nature, a biodiversity organization. *Lucy Bullivant*

Portland Tower will be planted all the way up

Portland, Oregon, is well known as a center of green architecture, so it should come as no surprise that Malaysian architect Ken Yeang, whose portfolio includes numerous ecofriendly skyscrapers in Asia, now has his sights on the city. Still in the financing stage, the $40 million Jumptown development, which takes its title from Portland's nickname during the Jazz Era, will center on a 10-story, 110-unit condominium tower designed to achieve a U.S. Green Building Council LEED Platinum rating. Yeang and Portland-based SERA Architects also plan to renovate an adjacent circa-1908 three-story building that once housed the famous Dude Ranch jazz club.

The tower's environment-friendly features will include a climate shield and sewage recycling facilities, but the most compelling element will be the planted grass that begins at ground level and then climbs via a sloped lawn and steep embankment to the roof of the building, 150 feet above ground, allowing for natural ventilation. "We wanted to integrate the human-made environment with the natural one," Yeang says. A glass outward-bending facade will permit sunlight to reach the lowest levels of the tower, while the roof will capture stormwater for reuse throughout the building. The ground level of the tower will likely have retail space and an amphitheater, while the Dude Ranch building will be home to a museum of Northwest jazz history.



Jumptown could drive the rebirth of a Portland's Lloyd District, which was the heart of Portland's black community before being largely wiped out in favor of a freeway and an arena during urban renewal. *Gregory Hafkin*

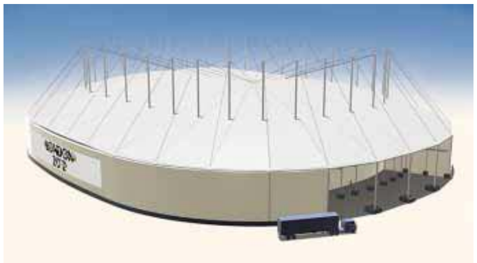
IMAGES: COURTESY RAFAEL VIÑOLY ARCHITECTS (TOP); DENTON CORKER MARSHALL (MIDDLE); KEN YEANG AND SERA (BOTTOM)

Assemble, disassemble, repeat London is planning to build stadiums for the 2012 Olympic games that can be easily disassembled, transported on trucks, and re-erected at new sites. The strategy will eliminate construction of facilities that might not be needed after the games, and open up space for further development, including 5,400 housing units and several square feet of commercial space in the Lower Lea Valley, where the games will be located.

At least three indoor arenas—12,000-seat stadiums for basketball and volleyball in London's Olympic Park, and a 6,000-seat stadium for handball next to the Millennium Dome—are now slated for relocation after the games. A spokesman for London 2012 says that structures for fencing and swimming may also be moved.

The recyclable structures will be made of steel, with durable precast-concrete seating, says David Henderson of Laing O'Rourke, the British design firm that developed the plans. The podlike structural-steel frames will be bolted into place, and the seats dropped in by crane. Similarly, toilets and changing rooms will be prefabricated and placed inside the frame. The buildings will be covered by durable teflon roofs whose structures will support lighting, scoreboards, and heavy snow.

"It provides an opportunity to make plans feasible that perhaps weren't feasible before," says James Bulley, London 2012's operations director. Bulley adds that the final decision on where the stadiums will be relocated will be made by the Sports Councils of the United Kingdom, a government-funded organization that oversees athletic activities in the country. *Paul Gains*



Stadiums will be moved elsewhere after the games.

Clooney building in Las Vegas Actor George Clooney, who robbed a Las Vegas casino in the 2001 movie *Ocean's Eleven*, is now looking to build one. Clooney is partnering with nightclub owner Rande Gerber, The Related Group, and Centra Properties in developing a $3 billion hotel-condo-casino complex, near the Las Vegas Strip. Plans call for 4,400 hotel, condo, and condo/hotel units in 11 high-rise buildings along Harmon Avenue, just west of the Hard Rock Hotel & Casino. The 8-million-square-foot project will have a 30,000-square-foot spa, swimming pools, shopping, and a 40,000-square-foot casino.

Las Ramblas, named after Barcelona's famed boulevard, will have a strict dress code, in contrast to the city's T-shirt-heavy atmosphere. Construction is scheduled to begin in mid-2006, with the first tower arriving in early 2008. Phase one will be designed by Arquitectonica, Philippe Starck, and Keith Hobbs, of United Designers Europe. The first four towers will contain 300 hotel rooms, 926 condo-hotel units, and 629 residences, connected by open-air esplanades.

Clooney's high-class casino/hotel/condos.

Arquitectonica principal Bernardo Fort-Brescia, FAIA, describes the urban-style plan as, "A street full of energy where interior and exterior spaces interact, where sidewalks are alive. The idea is that residents and guests can walk out of their building into a true urban environment, as in the great cities of the world." He describes styling with "clean lines, open flowing spaces, rooms with spatial drama and transparency that brings in natural light and expresses the functions within."

The 25-acre development will feature signature restaurants, clubs, and lounges from Gerber's After Midnight Company. Clooney, in addition to being an investor, is expected to contribute to the project's design and direction. *Ocean's Eleven* co-star Brad Pitt could also help design. *T.I.*

ENDNOTES

- On September 6, ground was broken for the $2.2 billion World Trade Center PATH station.
- Architect Fernando Távora, father of the Oporto School of Portuguese architects and teacher of Álvaro Siza Vieira and Eduardo Souto da Moura, died on September 3 at the age of 82.
- Richard Burdett, professor of architecture and city planning at the London School of Economics, will lead the 10th Venice Architecture Biennale. Entitled *The Meta-City: Issues in City Planning*, the exhibition will focus on the built response to changing populations and working habits.
- Los Angeles–based Anshen + Allen Architects has changed its name to CO Architects.

IMAGES: COURTESY LONDON 2012 (LEFT); ARQUITECTONICA (RIGHT)

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For and about
the emerging architect

archrecord2

Flourishing firms are making their mark on American cities. In this month's archrecord2, we profile emerging Austin, Texas, firm Alterstudio, that has proved its mettle with small projects, and is now poised to take on a boutique hotel. In Work: A program sponsored by Chicago's Young Architects Forum gives three creative teams cash money to find innovative solutions to a very urban problem: Where do you put your recycling? Also, visit Design, Work, Live, and Talk on our site for more upstarts.

Design

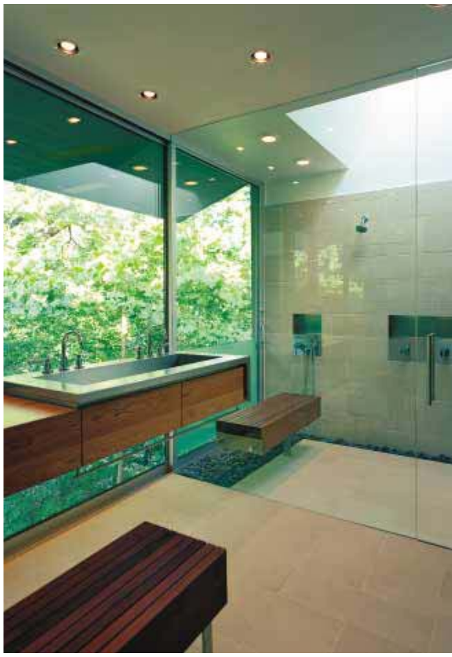
Alterstudio: No dogmatists here

According to Larry Speck, FAIA, former dean of the University of Texas (UT) at Austin's School of Architecture, Alterstudio takes lemons and makes lemonade. "But we don't always want to start with lemons," says firm principal Kevin Alter. "Sometimes we'd rather have chocolate or apples."

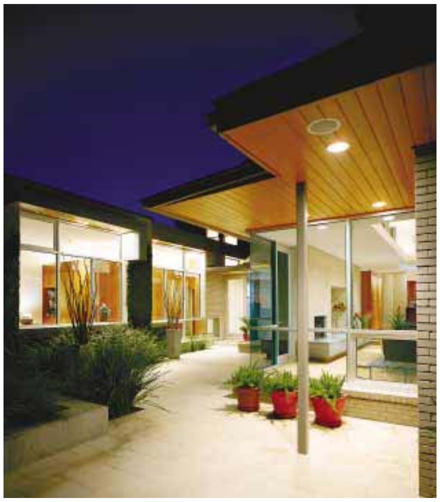
After several years of cutting its teeth on residential renovations and additions in Austin, Alterstudio finally has a commission that's better than chocolate—it's a plum. The five-person firm was commissioned by Habita Group to design a boutique hotel in Austin's South Congress district. The firm members' excitement about the project is palpable, and with good reason. Habita Group has hotels in Mexico City [RECORD, March 2001, page 106] and Playa del Carmen, Mexico, and has worked with major architects, including Enrique Norten and Ricardo Legorreta. This hotel in Austin is its first venture in the U.S.

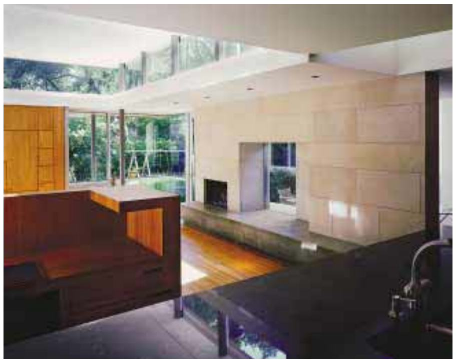
"This is a dream project for us because, as well as fantastic elements, a hotel also has the intimacy of a residential project," says Alter. The firm takes pride in its thoughtful Modern residential designs, referring to a sleek, Modern bathroom at the Hidden Cove Residence that Alter says "changed people's lives. The homeowner keeps calling us to tell us about the beauty of the light there, or a particular view out the floor-to-ceiling windows." That bathroom also won a Texas Society of Architects Award in 2004. "We take it as such a compliment that our clients have a continued relationship with us," says architect Russell Krepart. "After all, we know where they keep their underwear."

It's the intimate relationship between architecture and people that drives the firm to focus on the details of making things. "We're not interested in our work being unique," says Alter, "but we'd like our designs to make a difference." Four out of five members of the firm teach at UT (Alter is the associate dean for graduate programs there), and all have their own specialty. Partner Ernesto Cragnolino, AIA, is a welder, Mariana Moncada has hands-on construction expertise, Krepart knows the ins and outs of framing, while Jessica Carter is a graphics pro. "Having our specialties lets us bring new perspectives to each project," says Moncada.



Hidden Cove Residence, Austin, Texas, 2005
This project is a phased renovation of a home nestled into a lush, private inlet on Lake Austin. In the master bathroom, an opaque wall was replaced with sliding glass. An ipe bench in the shower, radiantly heated Leuters limestone floors and walls, and a river-stone-filled drain add to the serene atmosphere of the room.





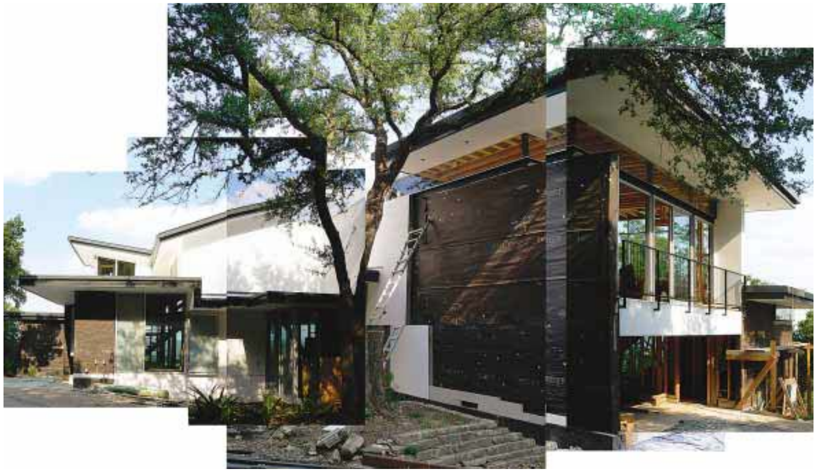
Hardouin House, Austin, Texas, 2001
This renovation and 1,600-square-foot expansion maintains the organization and character of a 1930s two-story brick house while adding openness, spatial continuity, and custom-built furniture.

PHOTOGRAPHY: COURTESY ALTERSTUDIO/THOMAS MCCONNELL PHOTOGRAPHY

Alterstudio's latest completed project required every bit of the firm members' expertise. Texas Hillel, a student center on the UT campus that has secular activities as well as religious services, was completed in 2005. It's the firm's first commercial project, and had a challenging program and specific design requirements. "Hillel's program is unusual, as it provides a forum for holiday and Sabbath services for Orthodox, Conservative, and Reform movements of Judaism," says Alter. "We had to create a place where spirituality is a part of everyday life, not 'sacred' or removed." Situated on a busy corner one block west of the university, the building's collection of abstract masonry and timber boxes houses rooms with free-flowing connective spaces. A glass curtain wall defines the building's precinct, which is wrapped with a variegated ipe-wood screen at the second level.

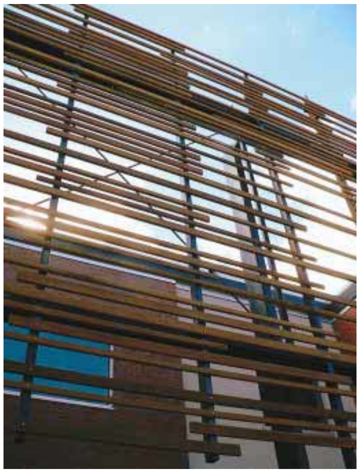
Alterstudio's members know that the success of Hillel, and the commission with Habita, may mean a time of growth for the firm. But they're not making strategic plans to expand yet, just enjoying the close-knit working relationship of a five-person firm. "It's a bit like being a small-town doctor," says Alter. "We have such a personal kinship with our clients that it's hard to imagine giving some of that up for the sake of getting lots of business." While admittedly not a "bread-and-butter" firm, Alterstudio would love to take on more projects outside Austin. With a prefab home in Hawaii in the design phase, and a new relationship established with Mexican hotelier Habita Group, it looks like Alterstudio's diet of Texas lemons and chocolate may just turn in time to more exotic flavors. *Ingrid Spencer*

For more images and information about Alterstudio, as well as other firms featured in Design, visit archrecord.construction.com/archrecord2/



Wildcat Hollow Residence, Austin, Texas, January 2006

Visitors enter the house under a low balcony at a mezzanine level to the great room, which opens out to a deck, revealing stunning views of downtown Austin.



Texas Hillel, University of Texas at Austin, 2004

Designed in collaboration with Sinclair Black and Andrew Vernooy, the design for this 18,000-square-foot community building called for space that would reflect spirituality as a part of daily life.

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A greener Chicago: reThink/reDesign/reCycle

***Ecotrio*, *Green Being*, and *Trios* may sound like the names of the latest New Age musical groups, but in fact they're three award-winning recycling receptacles that may soon find their way onto the streets of Chicago. They are the fruit of a competition called "reThink/reDesign/reCycle," organized by the AIA Chicago Young Architects Forum, that was created to engage the local design community in a worthy goal: to help make Chicago more environmentally friendly.**

"It's been a great revitalization of the thought processes surrounding recycling," says Jeffrey Missad, chair of the Young Architects Forum. "We wanted, and we got, entries that were interesting and practical and would make a person stop on the street and think about where they might put their empty bottle or can."

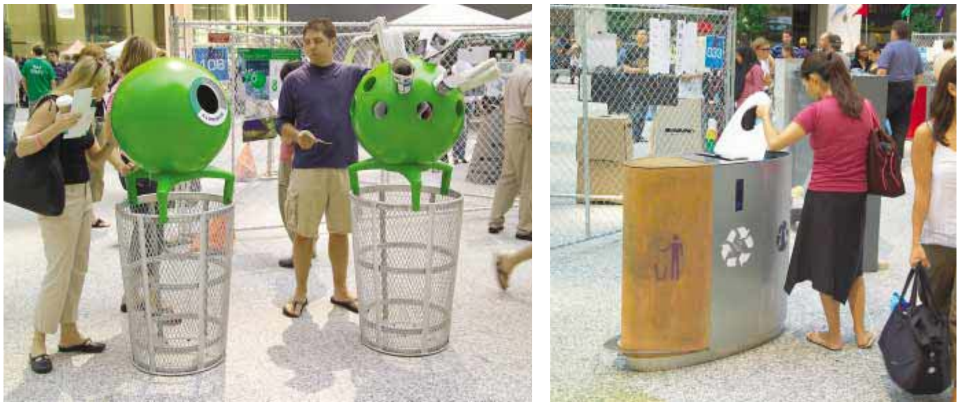
More than 100 entrants rose to the competition's challenge of designing a receptacle that was aesthetically pleasing, functional, and easily maintained. Creative solutions included the use of recycled elements in the designs, such as old bicycle parts or car tires; creating dual-purpose units, like a flower/planter/recycling bin; attaching recycling receptacle devices over existing trash barrels; and combining bus shelters with recycling bins.

Twenty-five finalists, which include the three winners, were chosen from the initial entries, and their built receptacles will be part of the city of Chicago's *Live Green* exhibition, which showcases strategies and products for recycling at home, at work, and at school. The event opens October 14 at the Chicago Architecture Foundation's CitySpace Gallery.

Cash prizes of $1,500, $1,000, and $500 were awarded to the winners, and Missad and the Young Architects Forum are currently negotiating with the City of Chicago to produce the receptacles and utilize them throughout the city.

And word is spreading. Missad says he was recently contacted by New York City officials with the intent of creating a similar competition in New York. "It was a meaningful, interactive, and fun project," he says. An idea to recycle, indeed. *Ingrid Spencer*

For more information on reThink/reDesign/reCycle, including images of finalist and winning entries, go to archrecord.construction.com/archrecord2/



Second-place winning entry Green Being, *by Emily Siegler and Steffi Xiao (left), and first-place winner* Ecotrio, *by Deborah Kang and Amanda Smith (right), who work at Skidmore, Owings & Merrill.*

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After the flood: rebuilding the physical and social fabric

Critique

By Michael Sorkin

How to comprehend the disaster of cities destroyed? It begins with the rush of analogies: the 9/11 attack, Baghdad, Dresden, the Chicago fire, Johnstown, Pompeii, the San Francisco quake. We assemble fragments and screen them on our own neighborhoods, imagining the high-water mark on our own streets, grappling with what would be lost here, speculating about the frayed ties and deepened bonds that a flood would produce. How would we deal—personally and collectively—with the lost commerce; the failure of public services such as power, water, and sewage; the unleashed misery; the greed?

Flooding threatens New Orleans's complex social ecologies as well as its buildings.

PHOTOGRAPHY: © AP PHOTO/DAVID J. PHILLIP

Living through 9/11 shapes my ability to assimilate the horror. Four years later, Ground Zero remains unreconstructed and controversial, a magnet for bad behavior. Only recently, ground was "broken" for the new transportation center designed by Santiago Calatrava. Just a few weeks ago, the city coughed up an enormous package of tax breaks to induce Goldman, Sachs to build its new headquarters near the site. Architects and developers preen. The memorial is unstarted and its features still contested, caught in arguments that continue to bring out the worst in people, focused now on how much free expression is to be permitted in the shadow of the "Freedom Tower," itself distilled to an imaginatively shriveled, heavily fortified symbol of triumphalist paranoia and real estate go-go.

Much of the early reaction to Katrina seems eerily familiar. Billions are appropriated for incompetent agencies of our government-hating government. Halliburton is to be further engorged with public funds, and money-grubbing lobbyists queue to the horizon. *The New York Times* runs a photo of a model of a house someone in Libeskind's office roughed out to try to get a piece of the action in Sri Lanka: The architect hero is ready to save us once again. Accusations fly about intelligence failures, starting with the refusal of the federal government to take seriously study after study that pointed out the jeopardy to coast and levees from major storms, maliciously cutting the budget for reinforcing the system year after year in blithe denial. Coastal wetlands—indispensable barriers and biological engines—are disappearing at the rate of 50 square miles a year, ravished by development secured by taxpayer compensation for those vacation houses that predictably get knocked down again and again. Bush continues to deny the impact of global warming, which everyone else on the planet acknowledges is contributing to the frequency and energy of hurricanes, to rising water (7 inches in the last century, 18 to 36 predicted for this one), to the decomposing heat.

Recriminations are important, and important now. Like the Trade Center attack, it was an unnatural disaster that doomed New Orleans. The city came through Katrina's wind and rain relatively intact, and citizens were already returning to the streets, relieved, when the lev-

Contributing editor Michael Sorkin is the director of the urban design program at City College of New York.

ees were breached by the risen water of Lake Ponchartrain.

Bring on the media spectacle. Sensitive celebrity reporters tear up and jabber endlessly about the *stench*, as the screen shows creepy subtitles proclaiming “State of Emergency” and armed troops pass in the background. Bill O’Reilly and his cohort of self-righteous talking heads mount their high horses over the *immorality* of looters (Fox-speak for black folk), depicting them as part of a culture that simply awaited a hurricane to liberate them from constraint. But no one in the media questions his or her own fundamental role in the manufacture of the array of unsustainable longings that figure in the American dream. Their moral parsing is sanctimoniously fine: One pair of sneakers might be justified because of nakedness, the second pair proves the intrinsic immorality of the poor. After all, if these “people” had gotten the message of the commercials that helpfully punctuate the TV coverage and owned cars like the rest of us, they would have been easily out of there.

Now we must really help. The huge appropriations coming out of Congress must be used deliberately, wisely, expeditiously. Urgent needs for food, medicine, shelter, and repairs must be quickly and compassionately met. But Katrina has not simply created a need for compensation; the storm has raised crucial questions about how we’ve lived, how we will live. Reconstruction is not enough, not a sufficiently capacious category to guide the mass action that will both produce and define recovery. This is even more true now than it was after the 2001 attacks. While that disaster was enormous, its site was remarkably small, given the scale of the havoc. Reconstruction was charged with a huge weight of symbolism but never allowed to raise fundamental questions about the nature of New York’s form and development.

Biloxi and New Orleans do not have the same luxury of a little-questioned return to business as usual and a focus on the aesthetic niceties of a lavish program of commemoration, of simply tearing down the Superdome, as if it were a Republican Bastille. September 11 caused death on a massive scale, but little homelessness. Many lives were lost, few jobs. For the planners of the future of Ground Zero, the issues are circumscribed. Much of the energy of the post-9/11 debate has been liberated by the artfully narrowed parameters of the reconstruction, which never exceeded the apportionment of proper ratios of office and civic space and the apt

Residents with cars escaped on their own, while many of the poor needed to be rescued.

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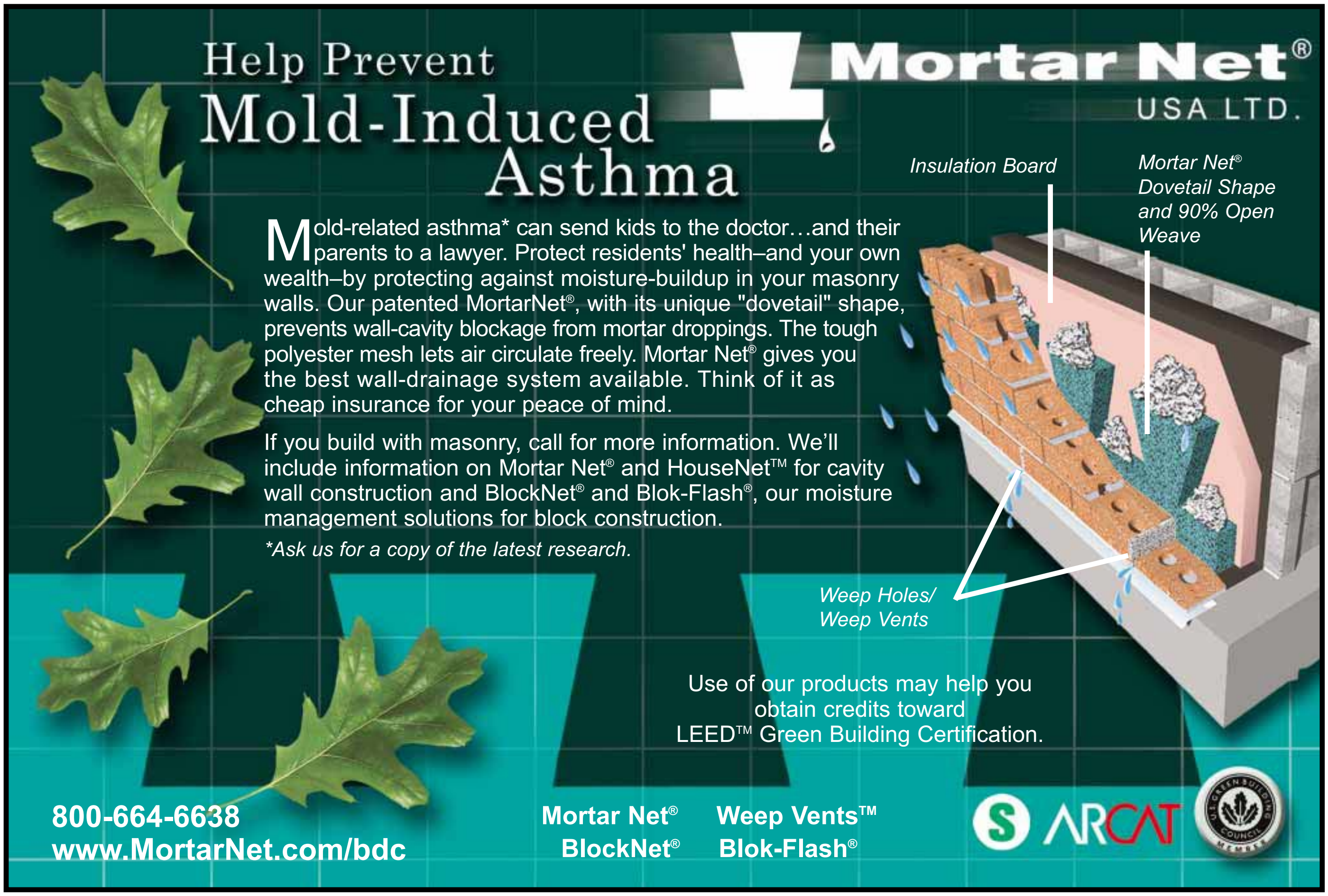
forms of symbolic commemoration of an event of frighteningly and deliberately Manichean clarity. And even this cannot, it seems, be accomplished.

Rebuilding and renewing our Gulf will be much more difficult. Calls to bring on the bulldozers to complete Katrina's remarkably focused urban renewal are irresponsible. New Orleans and Biloxi are treasures to be saved, not erased or reprocessed as Disneylands. And the ripped fabric is not simply architectural. New Orleans has the highest proportion of native-born citizens of any American city, and these connections in and to place down the generations are at the core of its genius. While it would be callous to talk about 9/11 or Katrina having "silver linings," both have wiped slates clean. To reflexively reproduce the status quo ante without vigorously questioning both its values and its defects would slight the disaster and obscure the urgency of the opportunity. Reconstruction must be modeled at all appropriate scales, and the complex ecologies of regions, cities, neighborhoods, and architectures harmonized with art and care, slighting none. Coastal development must be dramatically regulated. Wetlands must be massively renewed. The levee system must be rebuilt to a standard raised to the level of experience. The social fabric of neighborhoods must be mended and people restored to comfortable and familiar surroundings, to reestablished continuities. Buildings must be repaired.

But this is not enough. The easy theodicy of justification and blame must be put aside in favor of work that focuses not simply on restoration but on making life better, more responsible, more attuned to the realities of our prosperity and to a renewed sense of our shared project as Americans. The discourse must become high-minded, not merely high-flown, and the opportunity to shape truly sustainable communities immediately engaged. This is ultimately not more than a strategy for survival, the question Katrina most vividly begs. There's a powerful juxtaposition of the offshore city of glistening oil rigs (and the fantastical onshore refinery metropoles it supports)—all surely to be back online in no time, thanks to resources of a level never available to protect the public—with the stricken city ashore. This is the time to question the relationship radically, to reflect on the intimate connections between the fossil-fuel economy and the future of urban development.

Rebuilding must meditate decisively on sprawl and density, engage the role of renewables in powering our cities and lifestyles, act dramatically to expand public transportation, and revisit planning and building codes for sustainability and self-protection. Decisive, careful, and comprehensive planning is an imperative, the only way to mitigate the effects of outrageous poverty on the fabric and organization of the city, to recast urban organization along lines informed by 21st-century knowledge. It is the only way to deal with new pressures like the relocation onshore of the casinos that float along the Mississippi coast and the need to create new neighborhoods from scratch. Neglecting this is an affront to the dead and to the survivors.

And hope itself must be restored by making victims into collaborators in the creation of their own better futures, not simply spectators or consumers. A wonderfully encouraging moment in the midst of all the bleak coverage was a brief interview with a small contractor in New Orleans who was taped standing in front of a damaged house, visibly straining to get to work. Pleading for plywood and shingles, he put the urgency eloquently: "The faster we can build, the faster we can wake up from this nightmare." Time for us to help. ■



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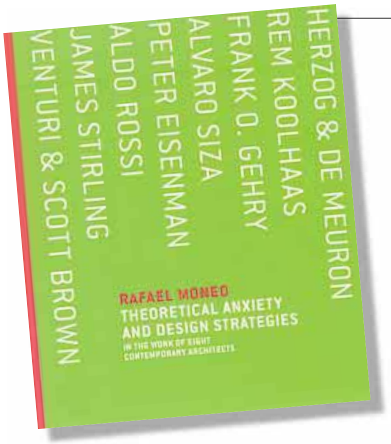
Essays by Moneo, plus work by Zaha, Gehry, Bohlin, and Blackwell

Books



Theoretical Anxiety and Design Strategies in the Work of Eight Contemporary Architects, *by Rafael Moneo. Cambridge: The MIT Press, 2005, 404 pages, $39.95.*

This collection of essays scrutinizes the work and ideas of eight contemporary architectural heavyweights "before they entered the Olympus of textbooks," writes Rafael Moneo. Originally delivered as lectures in the early 1990s, when Moneo was chair of Harvard's GSD, his essays have aged well. The title refers to the fact that recent dialogue in architectural circles, instead of elaborating systematic theories, has focused on critical discourse and reflection.

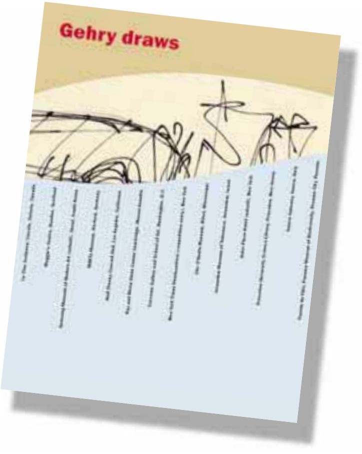
Each chapter highlights a shift in thinking. "It is obligatory to begin any study of the evolution of contemporary architecture with James Stirling," he contends, because Stirling connected the legacy of the older avant-gardes with the penchant for complexity that followed. Moneo then surveys the work of Robert Venturi and Denise Scott Brown, who famously denounced Modernism's tyranny in Venturi's *Complexity and Contradiction* in 1966. He then sifts through the work of Rossi and Eisenman—Rossi because his work became universally known in the late 1970s, and Eisenman for his attempt to make theory precede practice and for masterminding 1972's *Five Architects*. Alvaro Siza and Frank Gehry dominated the 1980s, Moneo contends, a decade that saw theory give way to pragmatism and new ways of handling materials and forms, at the same time that poststructuralism and deconstructivism were taking hold in architectural circles. The dramatic changes of the 1990s, he believes, were embodied by Rem Koolhaas, whom the author describes as wanting to "recover rationality" free of intellectual prejudice against developer buildings. By contrast, he concludes, the early work of Herzog & de Meuron revives the tradition of linking architects and painters.

The author follows a short overview of the architects with an examination of their key projects, focusing on the evolution of their ideas, forms, and style. To his credit, Moneo is often unabashedly critical.

Theoretical Anxiety isn't glossy coffee-table decor. The photos are black and white and small, mainly reminders of buildings we already know. But Moneo's insights and analyses are often brilliant, and his perspective as a Spaniard and as a former chair of the GSD is a unique one. He conveys his ideas in lively prose, peppered with anecdotes. *Andrea Oppenheimer Dean*

Gehry Draws, *edited by Mark Rappolt and Robert Violette, with an introduction by Hordt Bredekamp and commentary by Frank O. Gehry. Cambridge: The MIT Press, 2005, 496 pages, $50.*

There is a great tradition of architects drawing. Among the Modernists, Eric Mendelsohn or Antonio Sant'Elia's sketches stand out for their simple lines and dramatic urban silhouettes; Alvar Aalto's beautiful sketches provide an insight into the "organic" flow of space and details he envisioned for his houses and interiors; and Le Corbusier drew, painted, and sculpted with varying degrees of success. In later generations, Aldo Rossi and John Hedjuk are also known for beautiful models and sketches. *Gehry Draws* falls squarely within this tradition, documenting his work on 32 projects through 900 illustrations, mainly sketches, and some model photos. They're all dated and numbered, like old master prints, and include his comments and those of his collaborators. Horst Bredekamp provides an historical perspective on Gehry's drawing process, and Rene Daalder examines Gehry's relationship to computer modeling.



Coeditor Mark Rappolt provides the book's only (and very brief) critical essay. He makes a strong case for why these drawings might be important, referring to Robin Evans's great 1986 essay "Translations from Drawing to Building." The mention of Evans makes you realize exactly what's missing in this volume: a discussion of the complex matrix of relationships between architect, client, contractor, structural engineer, office associates, drawings, models, and computer renderings.

The drawings provide tantalizing glimpses of Gehry's visual and conceptual insights about urban issues in Bilbao, for instance, but give no real explanation of how they informed the design. Readers will hunger for a more critical text. But they will enjoy this giant feast of drawings, even though their investigative purpose is not always clear, and their relationship to the model photographs is sometimes obscure. *Grahame Shane*

Zaha Hadid: Complete Works, *by Gordana Fontana Giusti. New York: Rizzoli, 2004, 576 pages, four volumes slipcased, $125.*

To call this elaborate, overweight monograph premature is an understatement. Here's what you get: A quartet of volumes of various sizes,

containing cross-referenced texts, printed on thick-coated stock, that slip nicely into a rigid, transparent plastic box. It's an impressive package, but why didn't Rizzoli wait a few years, when Hadid will have more finished work to show?

The weightiest volume in the set, measuring 11 by 10½ inches and numbering 240 pages, is titled *Major and Completed Works*. That translates into three "seminal projects," seven works in progress, six bits and pieces categorized as "Recent Objects, Furniture, Exhibitions," and only five built works. Of those, only the Lois and Richard Rosenthal Center for Contemporary Art, in Cincinnati, can be deemed "major" in terms of program, budget, and so forth.

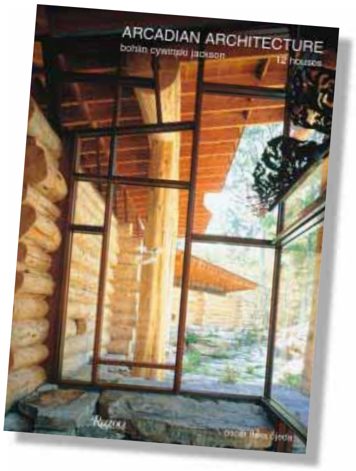
Hadid's world, as presented here, is hard-edged and hard-surfaced, consisting of designs that frequently swoop off at 45-degree angles when viewed in plan. Many seem to exist in a computer-generated nighttime desert, and most are hard to imagine built. Hadid's sketches, rarely beautiful or intellectually compelling, often occupy full pages, as if they were recently discovered da Vinci drawings or Louis Kahn's first conceptual ideas for Dhaka.

Giusti's accompanying text is pretentious and not very helpful, with talk of such things as "mutually exclusive paradigms of urban design" and "reciprocal relationships between static and dynamic elements at all scales." The set's littlest book, *Process: Sketches and Drawings*, measuring just 5 inches square, is virtually text-free—and that's a blessing.

It's been suggested that publishers are trying to find ways to combat the ready supply of information online, but why this package was assembled, and who will lay down $125 for these volumes, are anybody's guesses. *Allen Freeman*

Arcadian Architecture: Bohlin Cywinski Jackson—12 Houses, *by Peter Bohlin (contributor), et al; edited by Oscar Riera Ojeda. New York: Rizzoli, 2005, 426 pages, $65.*

In his introduction to *Arcadian Architecture,* Thomas Fisher classifies Bohlin Cywinski Jackson's houses into three categories: the forest retreat, a kind of fantasy of Rousseau's natural house, including a 1972 Adirondack house by Bohlin; the castle or ruin (like the 1981 Gaffney Residence in Coatesville, Pennsylvania); and the primitive hut, "which seeks neither to disappear into nature nor defend us from it," writes Fisher. He cites Bohlin's own house in Waverly, Pennsylvania, where stone walls, wood decks, and flagstone walks have a simplicity and purity that recall traditional



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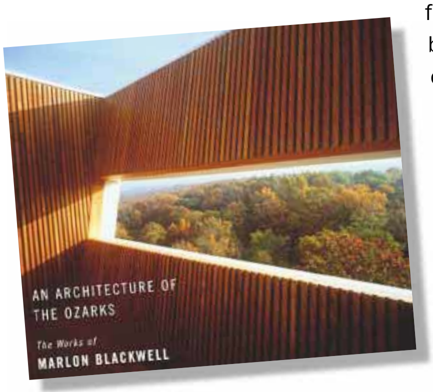
Japanese houses and gardens. Yet its Minimal interiors and exposed wood structure also bring to mind the direct, sparse qualities of vernacular American houses. Paul Goldberger has accurately described Bohlin as a "romantic Modernist, determined to use the forms of Modernism to achieve the emotional impact of traditionalism." Bohlin, in writing about his work, praises "the emotions that all things evoke … how they calm or trigger fear, how they remind us of other places."

Today, the firm Bohlin Cywinski Jackson designs large, complex buildings and runs five offices on both coasts. But the work retains its roots in the firm's arcadian houses that respond to the nature of place, materials, craft, and circumstance while evoking emotion and collective memories. *Arcadian Houses* is beautifully produced; it's a keeper. *A.O.D.*

An Architecture of the Ozarks: The Works of Marlon Blackwell, *by Marlon Blackwell, David Buege, Dan Hoffman, Juhani Pallasmaa. New York: Princeton Architectural Press, 2005, 192 pages, $40.*

The rocky hills of the Ozarks are geographically ambivalent: not quite South, Midwest, or West, but bearing traits of all three. Home to Wal-Mart and abundant poultry farms, the region is chock-a-block with American roadside tourist culture—cabin motels, miniature golf courses, purveyors of kitsch. Dotting the countryside are long, low chicken houses, rusting trailers, and ramshackle agricultural structures. The only architecture of note is by Wright disciple Fay Jones and his heir apparent, Marlon Blackwell.

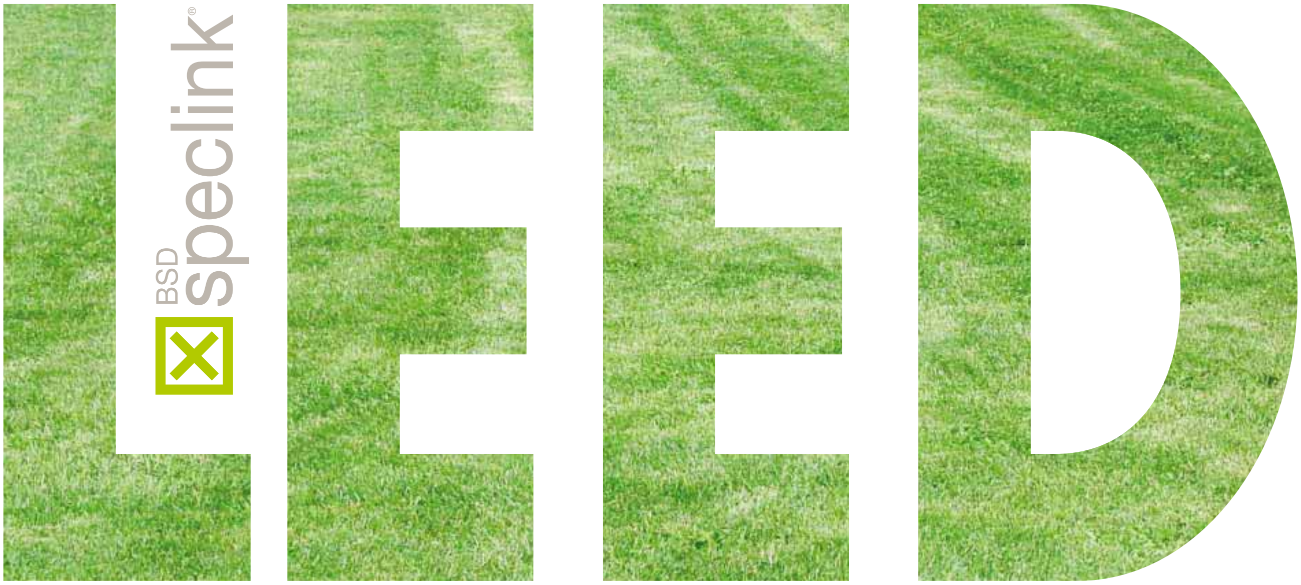
Blackwell accepts his world as it is and works comfortably "in this complex, disheveled culture, especially when allowed to work in settings offering nature's last vestiges," David Buege writes in his thoughtful introduction. Juhani Pallasmaa commends Blackwell's decision not to shun "an undesirable reality" for its ethical basis.



At the knees of Mississippi architect Chris Risher and Samuel Mockbee, under whom he studied, Blackwell learned to use Modernist design principles to transform backroad culture. Like Mockbee, he delights in quirkiness. During the early 1990s, for example, he designed three prototype houses: the Bullfrog House, a cross between the Villa Savoye and the common bullfrog; the Dragonfly House, a dragonfly-cum-camper; and the HouseBoat-BoatHouse, intended for waterways with active flood plains and inspired by the barge or keelboat stacked with changing shapes. Blackwell's work is tactile, unsentimental, and unpretentious.

David Hoffman talks of Blackwell assuming "the responsibility as a primary interpreter of the local tradition through the invention of new hybrid forms and motifs that are then adopted by students and other architects." An example is the BarnHouse, a combination barn, garage, and house that mixes suburban and rural typologies.

Blackwell's designs gain authority with every new project, and this handsome volume assesses his work at an early midpoint in his career. We look forward to volume two. *A.O.D.*



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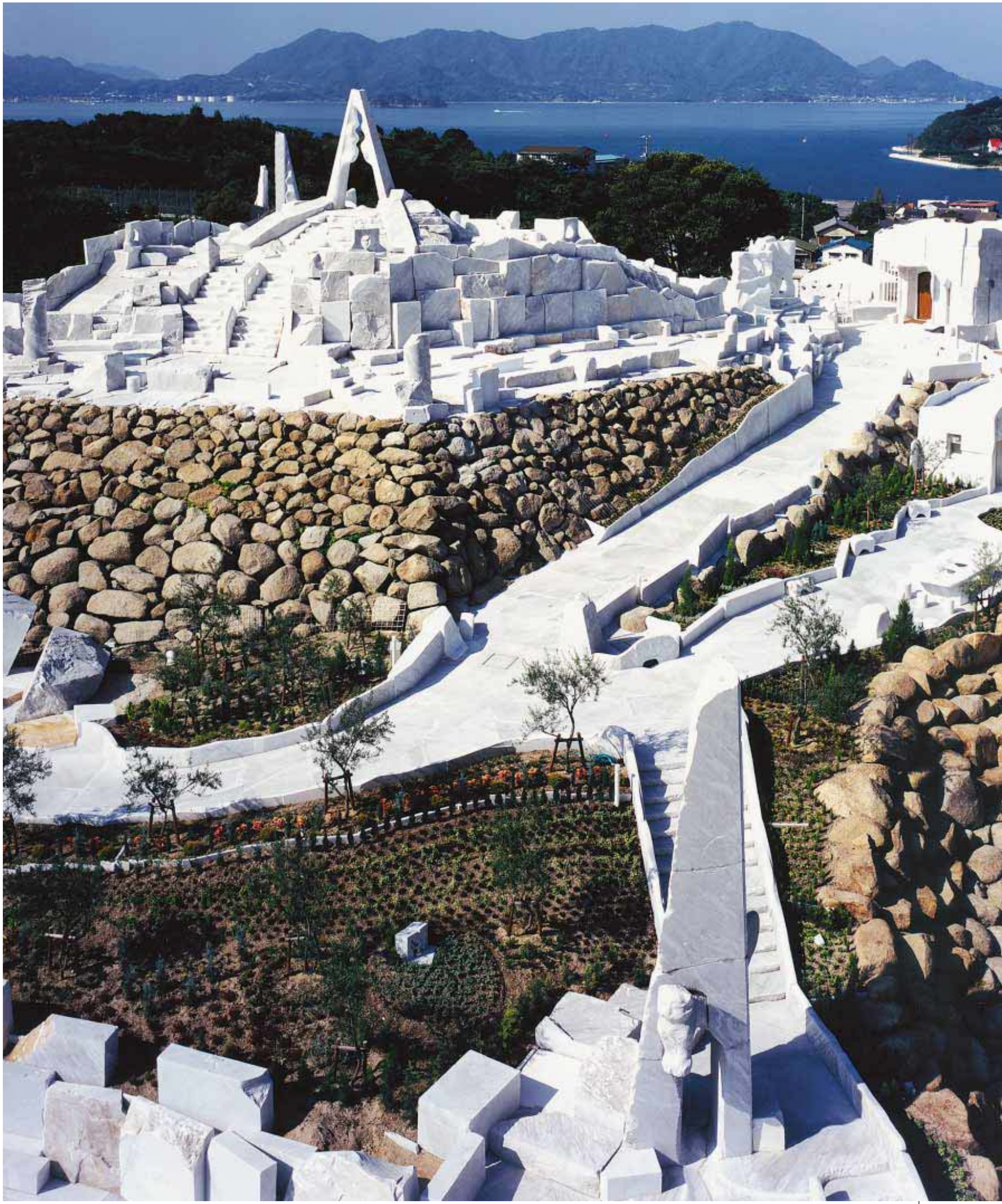


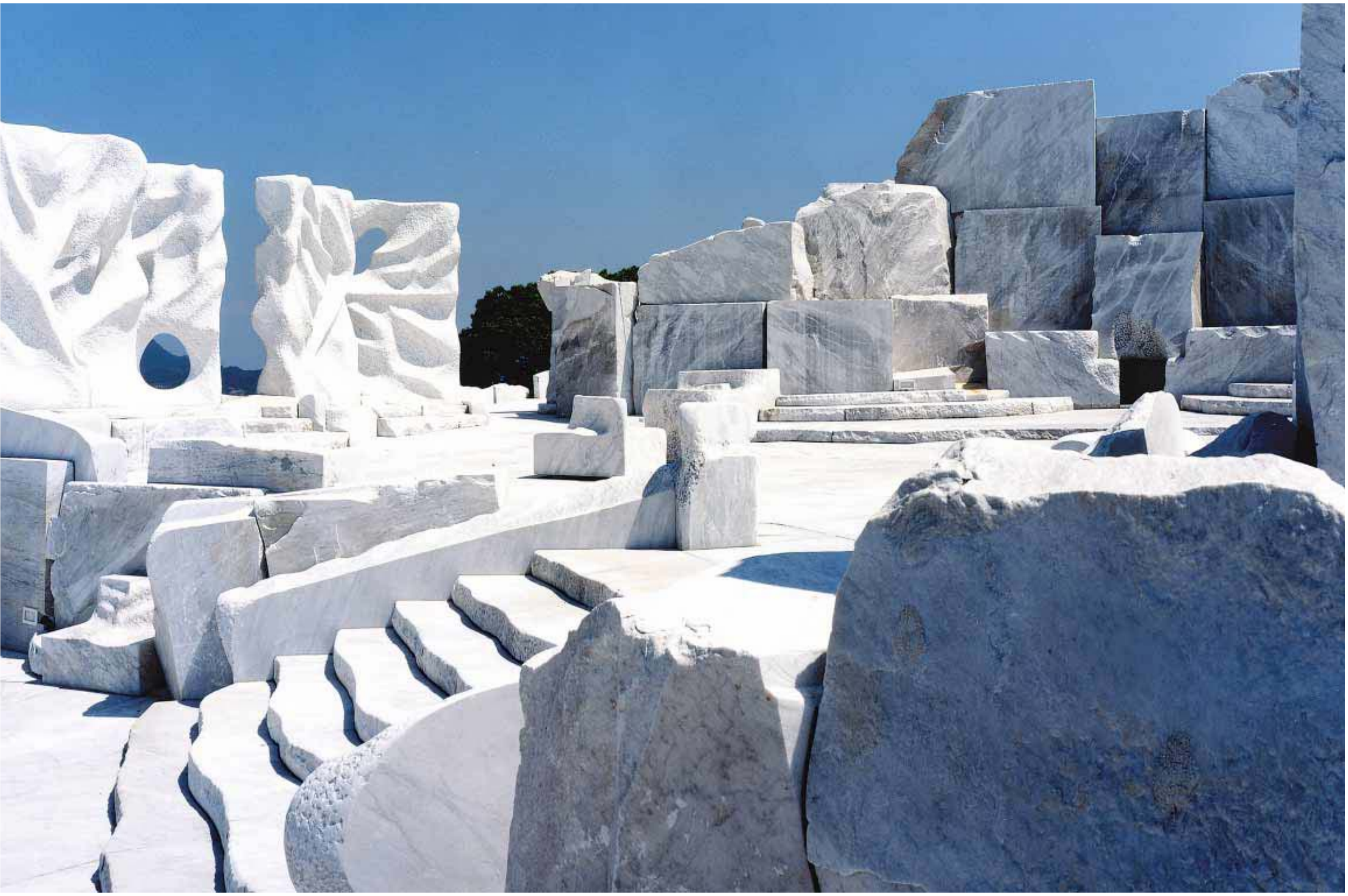
By Ingrid Spencer

Hill of Hope—a sculptor's lifetime work in marble

"When I met him, he had been sleeping for centuries, and I thought, 'It is a shame to let him sleep like this.' From that moment, I dreamed of taking him to Japan." So says sculptor Kazuto Kuetani about the 3,000 tons of Carrara marble that he transported to Japan's island of Ikuchi to create the Hill of Hope—a breathtaking 16,400-square-foot environmental sculpture at the Kosanji Temple at Setoda-cho, in the prefecture of Hiroshima.

PHOTOGRAPHY: © MASAHIKO TANAKA

After 12 years of work, the monumental sculpture, made of tens of thousands of small and large pieces of white marble, is now half done. Like the bleached bones of a giant Atlantis risen from the sea, the organic forms and sculpted paths, parapets, benches, stairs, and arches of Kuetani's "temple of the 21st century" conjure a lost metropolis rendered pure in its whiteness. "It's now part of nature," says Kuetani of the sculpture, which he refers to as his life's work, "and you can stand in the middle and touch the marble and experience its bulk

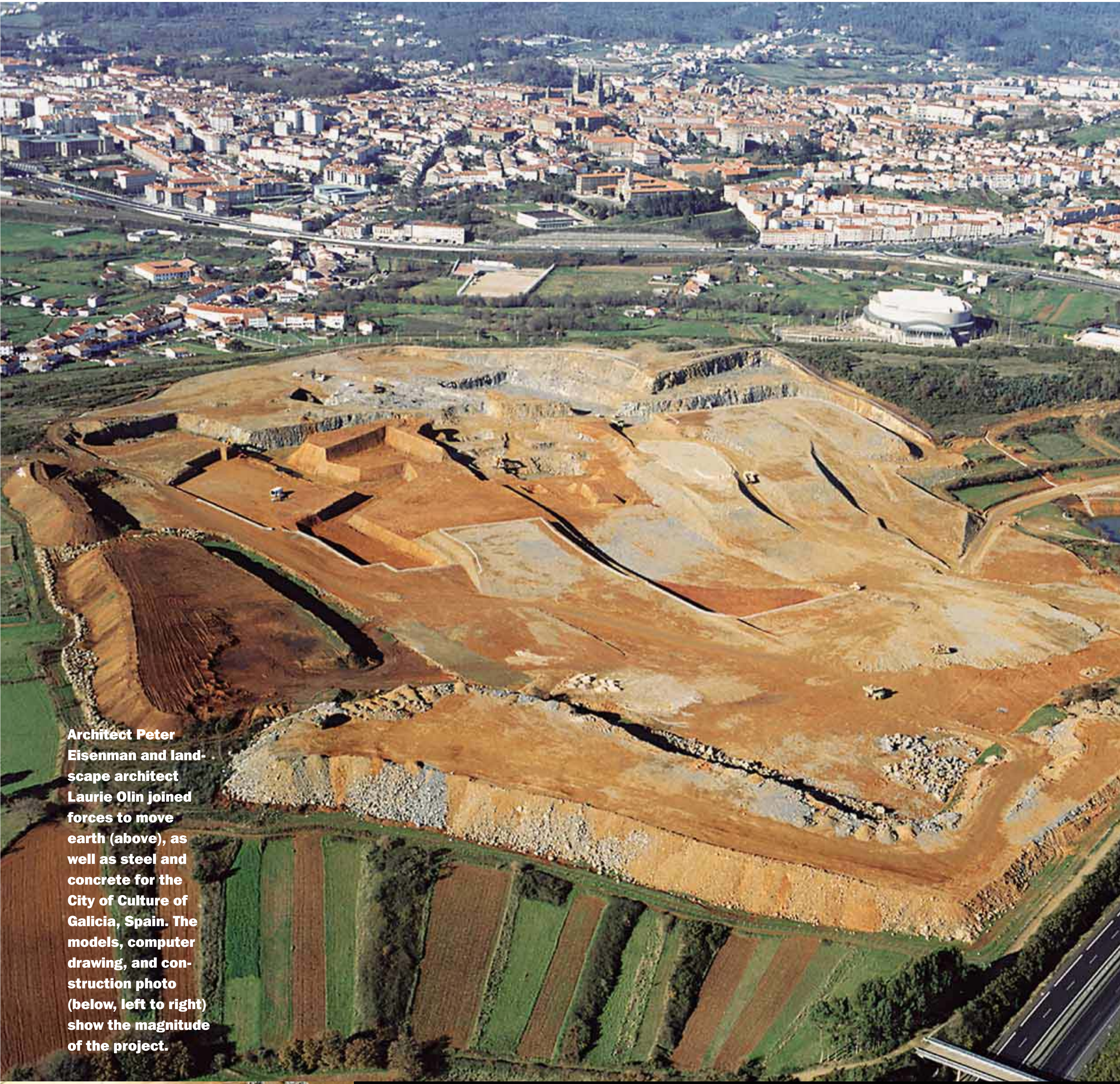


Kuetani used structural elements such as stainless-steel poles and granite as a base for the 3,000 tons of marble that make up the expansive sculpture.

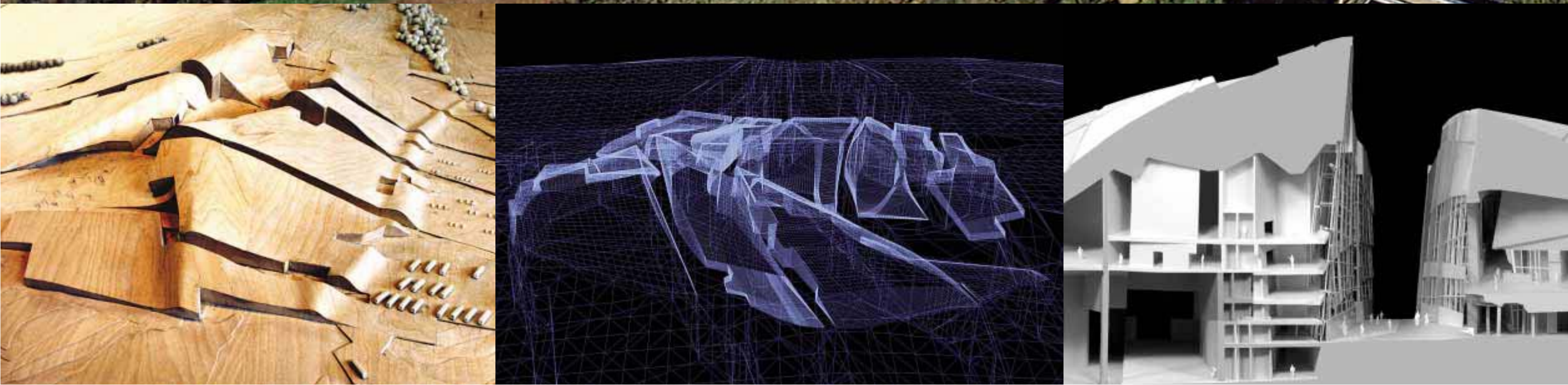
directly. I wanted to create an environment where man, sculpture, and nature balance with and understand each other, where children would be eager to leap onto the sculptures, and where hurried working people could find a little peace and quiet by being ushered into a time that stands still."

Kuetani, who has worked with Italian marble since the late 1960s, first met the main priest of the Kosanji Temple, the chief temple of the Pure Land Sect of Buddhism, in 1985. The temple grounds, which include a museum housing some 2,000 important cultural works, span 164,000 square feet. The priests wanted to add a park that would show "love of mother," a theme related to the temple's origins. Kosanji was founded in 1936 by the Reverend Koso in memory of his mother. In 1927, when Koso, then a successful industrialist (said to be the inventor of steel-pipe welding), was 36, he built a villa for her in Setoda-cho. After her death in 1934, he became a Buddhist priest and created the Kosanji Temple at the site of the villa in her honor. Koso died in 1970.

Winner of this year's Internazionale Marmi E Macchine Carrara Marble Architectural Award for Urban Landscape, Hill of Hope will grow as Kuetani continues to sculpt his perfect "sentiment of gratitude towards nature and the mother." ■



Architect Peter Eisenman and landscape architect Laurie Olin joined forces to move earth (above), as well as steel and concrete for the City of Culture of Galicia, Spain. The models, computer drawing, and construction photo (below, left to right) show the magnitude of the project.



Landform future

Architects are literally digging down for inspiration and in so doing are collaborating with landscape architects

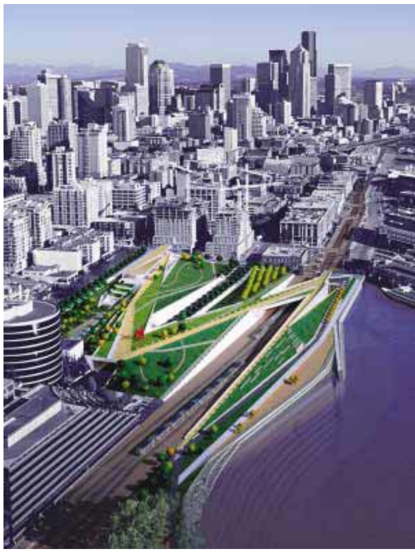
By Paula Deitz

In 1964, when Bernard Rudofsky wrote of "the challenge of topography" in his seminal work *Architecture Without Architects*, little did he imagine the import that topography as an organizing principle would exert on 21st-century architecture. In a recent book, *Landscrapers: Building with the Land* (Thames and Hudson), Aaron Betsky, director of the Netherlands Architecture Institute, has heralded the joint engineering of the land and structure as a "utopian form of architecture." In what appears to be a movement, architects, given the opportunity of a spacious site, have an increased awareness of the importance of melding their design with the existing environment. And gone are the days when landscape architects were viewed only as enhancers of surrounding settings.

Now architects and landscape architects are collaborating in designing buildings that are essentially landform structures in and of themselves. In describing his long collaboration with architect Peter Eisenman, landscape architect Laurie Olin speaks of "the relationship between buildings and site—and our exploration of ways that the two might be considered as aspects of the same thing." As he elaborates, "This is a bit more than thinking of architecture and landscape as being commingled or working in harmony, but rather thinking (and making) each an extension of the other, conceived and built as a continuum." This form, Olin acknowledges, grows out of the topography of place.

Although Eisenman and Olin have been working together since completing the Wexner Center for the Arts in Columbus, Ohio, in 1989—drawing buildings and landscapes as one integrated unit—only two of their 20-some projects have been built, the other being the recently opened Memorial to the Murdered Jews of Europe in Berlin [RECORD, July 2005, page 120]. As in any long creative process, even unbuilt projects serve to solidify ideas and lead to new ones. Their current collaboration on the City of Culture of Galicia, above the medieval pilgrimage town of Santiago de Compostela, is a true culmination of their long partnership combining theoretical concepts once nurtured separately.

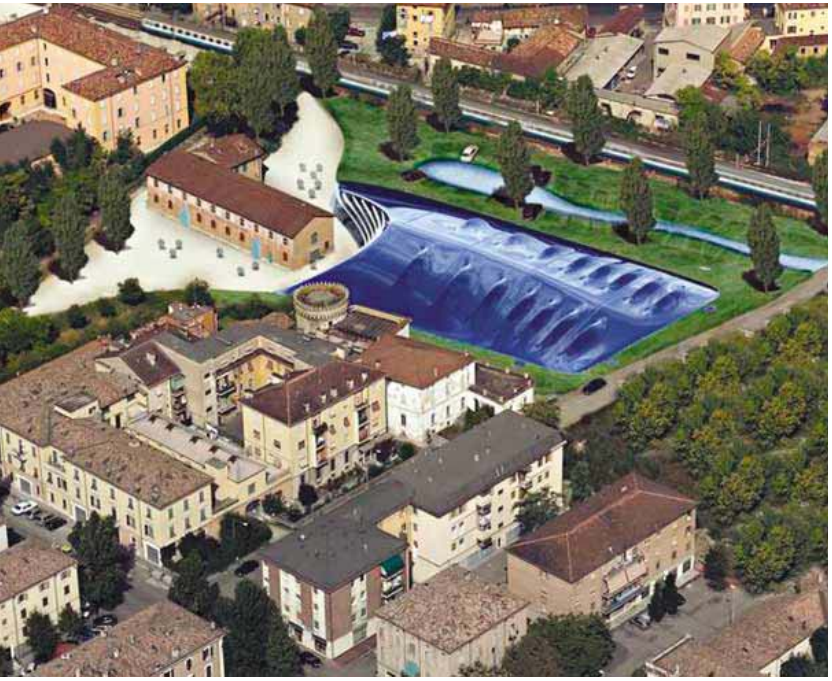
Anyone who saw the first models of the City of Culture exhibited at the Spanish Institute in New York in 2001, or heard the architects in a dialogue on "The Processes of Santiago" at the Architectural League of New York last February, understands to what degree this complex of six undulating ribbons of buildings emerging from Monte Gaiás and a mass of trees surpasses earlier projects and expresses new concepts in urbanism. Since



Weiss/Manfredi is creating the Olympic Sculpture Park in Seattle (above) with Charles Anderson.

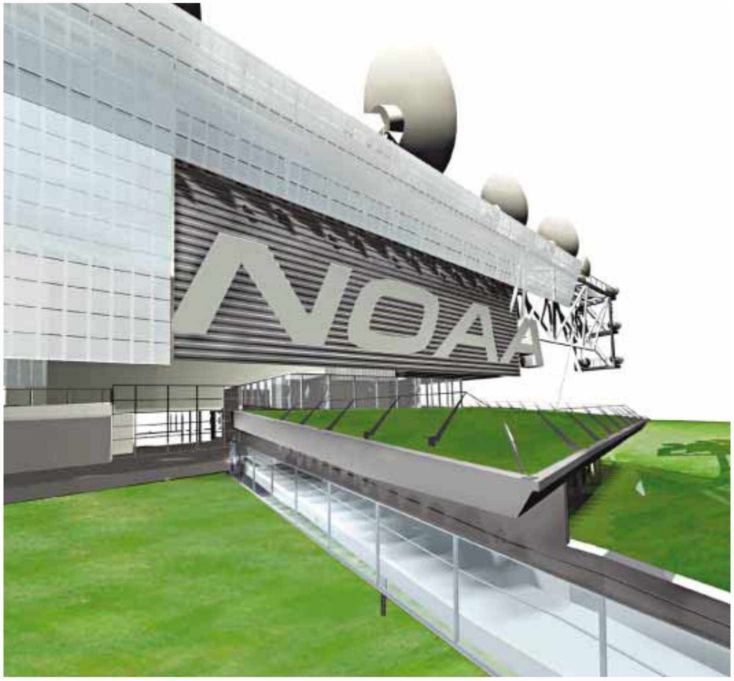
IMAGES: © PAISAJES ESPAÑOLES, S.A. (TOP SPREAD); COURTESY PETER EISENMAN (BOTTOM SPREAD); WEISS/MANFREDI (THIS PAGE, RIGHT)

Paula Deitz is editor of the Hudson Review *and writes frequently about landscape architecture.*



Maserati Museum, Future Systems with Arup Engineers

Located in Modena, Italy, car capital of Italy (birthplace of the Maserati car and company founder Enzo Ferrari), the 50,000-square-foot Maserati Museum is planned for the grounds of Enzo Ferrari's turn-of-the-20th-century home. (No completion date is set.) The museum's blue aluminum roof, curved and pierced with openings emulating racing car air vents, rises about 30 feet and is submerged about 20 feet, supported by hidden concrete retaining walls. The museum's earthbound design, which was determined by the modest scale of an existing brick workshop being restored for the museum, as well as a tight site, encouraged a close collaboration with engineers (Arup) rather than with a landscape architect. A wall of inclined glass draws visitors into the museum, where more daylight is admitted through the roof slots and amplified by white terrazzo walls and floors. "It's like a museum, a sculpture gallery, not a garage," notes Jan Kaplicky, of Future Systems.



NOAA Satellite Operations Control Center, Morphosis Architects with EDAW Landscape Architects

Scheduled to open this fall, this 208,000-square-foot operations facility for the National Oceanographic and Atmospheric Administration, located in Suitland, Maryland, will provide environmental data for weather predictions and distress signals. The project minimizes the presence of the building by concealing administrative and support functions, which make up two thirds of the program, within the natural contours of the site. Spaces related to satellite operations will be sheltered in a central, three-story bar that projects above ground. A glass lobby with a security checkpoint links the structures. The glass-and-steel structure will also include an observation platform for educational tours and community outreach. "It's technology and landscape in almost a violent collision," says EDAW principal Dennis Carmichael, who worked with Thom Mayne of Morphosis. "It represents where things are going."

IMAGES: COURTESY FUTURE SYSTEMS (LEFT); MORPHOSIS (RIGHT)

the purpose of the City of Culture—with two libraries, an audiovisual center, photography bank, history museum, and opera house—is to capitalize on the intersection of technology and information systems with art and culture, the buildings themselves on the 173-acre site are tangible proof of the possibilities that can be achieved through technology without losing the memory of the land.

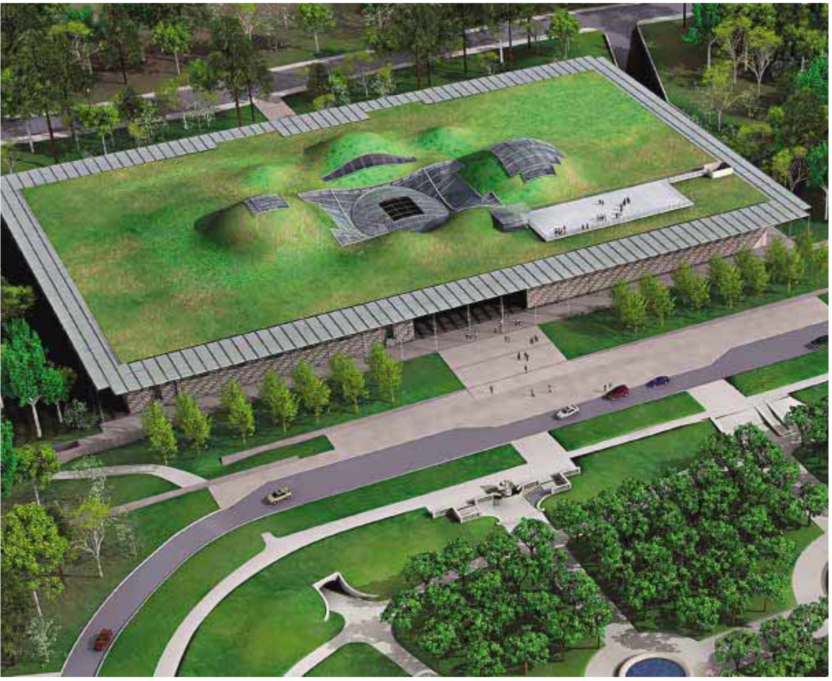
Although the City of Culture appears to be a long way from Eisenman's squared-off House III (1973), which rotated one cube inside another, he has remained true to abstract Modernism destabilized by other figurative programs related to the site. Olin is also a Modernist, but with a touch of Le Nôtre, the 17th-century landscape architect for Versailles. If Olin is known for such orderly, populous, urban sites as Bryant Park and the just-completed renovation of Columbus Circle (a Place de la Concorde for New York, brimming with fountains), he also adds other dimensions to his work through his eye for what Frederick Law Olmsted valued as natural scenery.

For the Galicia project, cultural and geological elements merge in a solution that combines nature and urbanity. The architects began by overlaying the site with the figure of a furrowed scallop shell, symbolic of James the Apostle, whose relics have drawn pilgrims to Santiago since the 12th century. Then they transposed onto the site plan the medieval streets from the historic core of Santiago, warped by the computer, according to Eisenman, as if the topography of the hill were somehow pushed through them. Finally, a Cartesian grid was superimposed to create a variable tartan of unequal intersecting lines. From this three-dimensional model resulted the distorted, tilting, undulating ensemble of buildings and red sandstone walkways with a large plaza. "Instead of the ground being conceived as a backdrop against which the buildings stand out as figures [read the Acropolis], we generate a condition in which the ground can rear up to become figure, and the buildings subside into the ground," Eisenman explains. The interiors reflect the same folding and fluid surfaces.

Cast over the site plan is a grid of cork oaks recalling agricultural plantings in social centers of Spanish towns. Local grasses and wildflowers creep up the sides of the apparently "excavated" structures of the hilltop to meet roof cladding of native granite slabs. In this northwest corner of the Iberian peninsula, these wavelike volumes are unintentionally reminiscent of the ancient robust granite storehouses for corn described by Rudofsky.

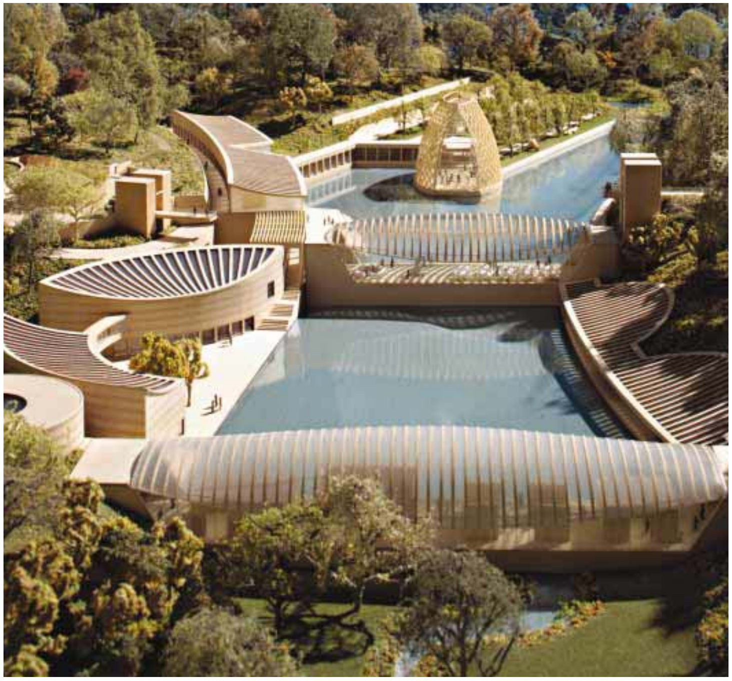
Olin likens the ensemble to the ruins of Etruscan tombs at Cerveteri, north of Rome, where the structures emerge from the landscape at different levels so that they all become one. To complete the illusion here of the mountainous landscape, the plan includes a new forest of Galicia along the steeply terraced slopes descending from the City of Culture. Though Olin has initiated plantings of oaks, birches, mountain ashes, and hawthorns placed on a grid, he knows that the percentages have to be right in order for the natural selective process to turn them eventually into a true hillside forest.

In a different approach to landform architecture, the con-



California Academy of Sciences, Renzo Piano Building Workshop with SWA Landscape Architects

The 400,000-square-foot museum, in San Francisco's Golden Gate Park, updates the 86-year-old academy complex, damaged in a 1989 earthquake. In keeping with the academy's mission, the design not only incorporates green elements, such as natural ventilation and solar panels, but features a 180,000-square-foot green roof that will dominate the exterior. Planted with native vegetation (now being grown on a site outside the city), the roof will curve over the building's aquarium, rain forest exhibit, and planetarium, and curve down at its center into a central piazza. Landscaping will be held in place with gabions (wire cages filled with crushed stone), which will be covered with greenery, while the structure will be supported by a system of cables that Piano calls the "spider web." Floor-to-ceiling glass walls will line the east and west sides of the building. Completion is set for 2008.



Crystal Bridges Museum, Moshe Safdie and Associates with Peter Walker and Partners

Sponsored chiefly by Wal-Mart founder Sam Walton's daughter, Alice, the 100,000-square-foot museum will be located in a 100-acre wooded canyon in Bentonville, Arkansas. Five of the six ribbed museum structures, covered mostly with glass and wood, will be dug into the landscape, acting as retaining walls. On the inside of the complex, two bridges connecting the buildings function as dams, helping create large interior pools using a nearby stream as the water source. Other landscape elements enveloping the buildings include outdoor sculpture galleries and a terraced garden. "From the outside, you see the buildings sinking down into the landscape," explains Walker. "It becomes part of the land. For us as landscapers, it's not about finishes; it's about making all the systems compatible." Completion is scheduled for 2009. (More landform projects are featured in Record News, page 60.)

IMAGES: COURTESY SWA (LEFT); PETER WALKER AND PARTNERS (RIGHT)

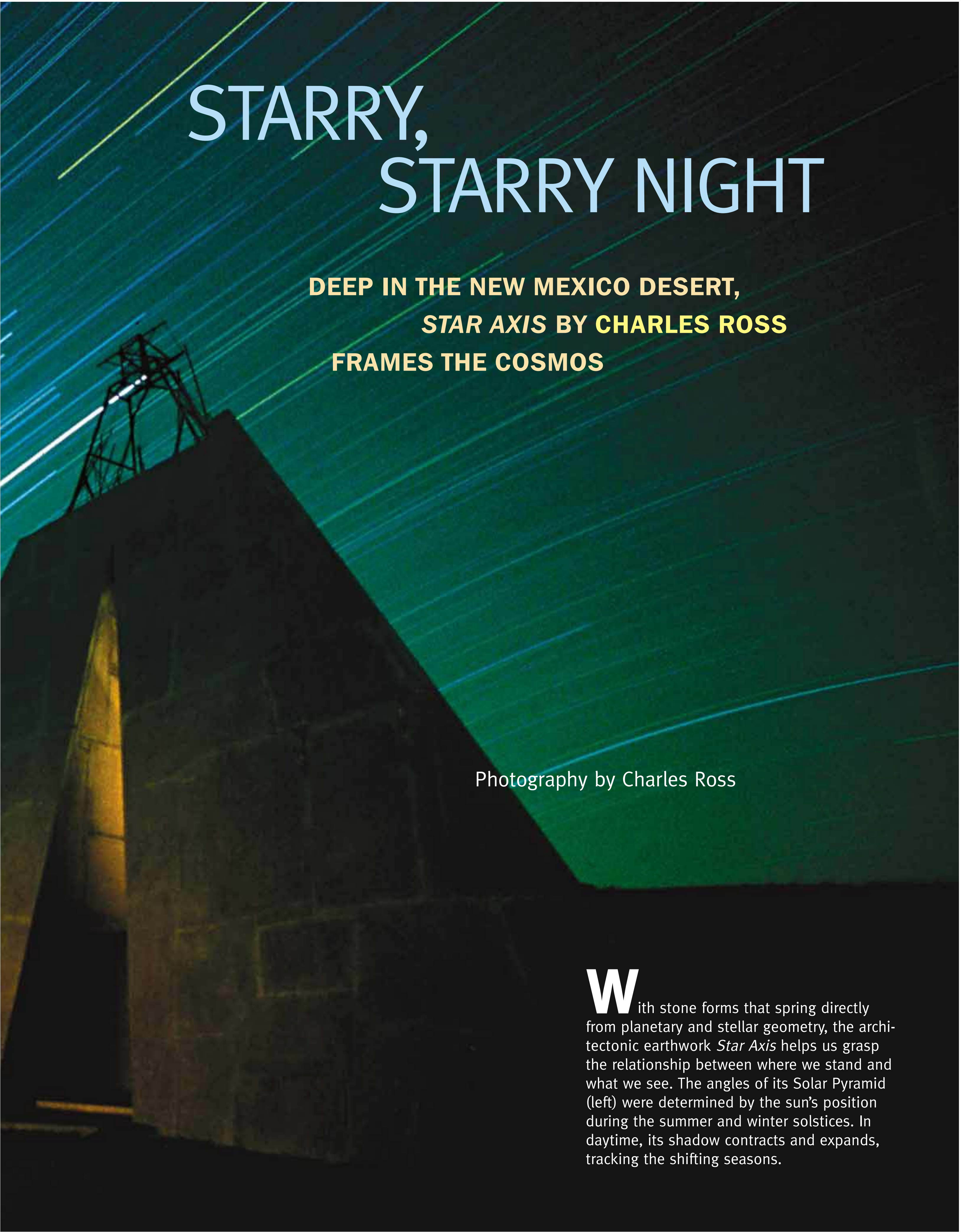
structed topography of Seattle Art Museum's Olympic Sculpture Park by Weiss/Manfredi Architects offers a means of healing a divisive rift of urban infrastructure along the derelict site of a former fuel storage and transfer station. In 1976, sculpture had already begun to encroach north of this shoreline area with Michael Heizer's massive *Adjacent, Against, Upon* on landfill with railroad tracks running behind it.

Clearly, the openness and abundant light on waterfronts present coastal cities as ideal locations for displaying the kind of oversize sculpture difficult to house in museums. In their design for the Olympic Sculpture Park, Marion Weiss and Michael A. Manfredi were faced with a 40-foot drop from street level to the water's edge at a location divided by the same railroad tracks and a four-lane highway. Drawing on earlier experiences in mechanically stabilized earth, they created a wide, descending zigzag of a park that bridges seamlessly over the transportation "gorges." The firm's design for the Museum of the Earth in Ithaca, New York [RECORD January 2004, page 112], incorporates a series of berms that conceal parked cars but also purify runoff water through plantings of equisetum; eventually, the overflow of clean water discharges into Lake Cayuga. A similar technology will carry excess water from Olympic Park into Elliott Bay.

In this case, a glass pavilion with galleries at street level acts as an extension of the landscape, and a cut through the sloping roof opens to spectacular views over Puget Sound. Along the first descent, a forest of conifers and redwoods surrounds an upper-level sculpture garden; from there, the landscape unfurls along grassy paths above sheered slopes planted with fragrant wild roses and supported by concrete slabs that double as screens for video art. The architects are restoring the shoreline into a new recreational beach.

Working with local landscape architect Charles Anderson for horticultural materials, the architects have designed an intimate, aerial park that offers appropriately open settings for the museum's extensive sculpture collection, with works by David Smith, Alexander Calder, Toni Smith, and Mark di Suvero. The level changes and sloping platforms provide an opportunity for distant viewing from different angles that adds to a critical appreciation of three-dimensional objects that cannot be perceived in a flat space.

As a totally constructed environment, like the City of Culture, the Olympic Sculpture Park qualifies for Olin's definition of landform architecture as simply a set of built structures that end up being a landscape. What may have begun as a gesture to energy conservation or sustainable development has evolved into a new aesthetic that shapes inside and outside as a continuum, to use Olin's words. As the architectural firm Weiss/Manfredi has turned to landscape to devise architecture by sculpting the land with felicitous results, Eisenman, in his long collaboration and discussions with Olin, has discovered in local topography a means of merging multidimensional concepts into a veritable eruption of the land. As Olin remarks, "The history of architecture is not over; there is still more to come." Landscape architecture is definitely in its future. ■

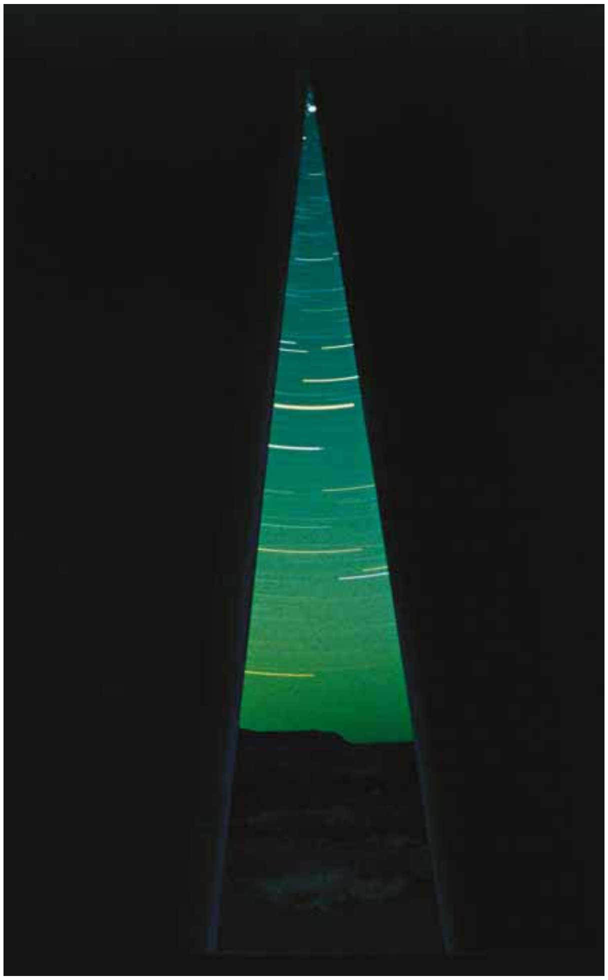


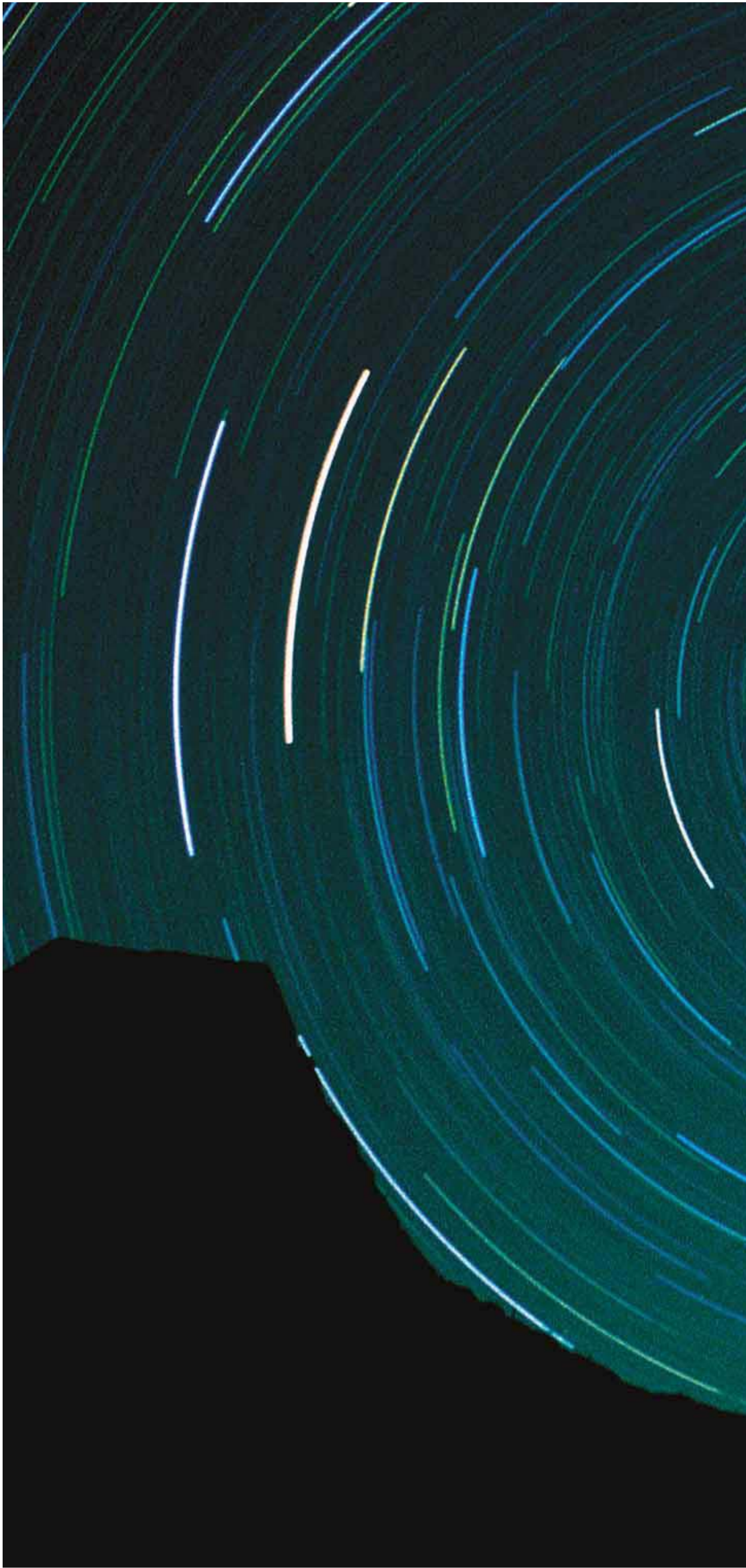
STARRY, STARRY NIGHT

DEEP IN THE NEW MEXICO DESERT, *STAR AXIS* BY CHARLES ROSS FRAMES THE COSMOS

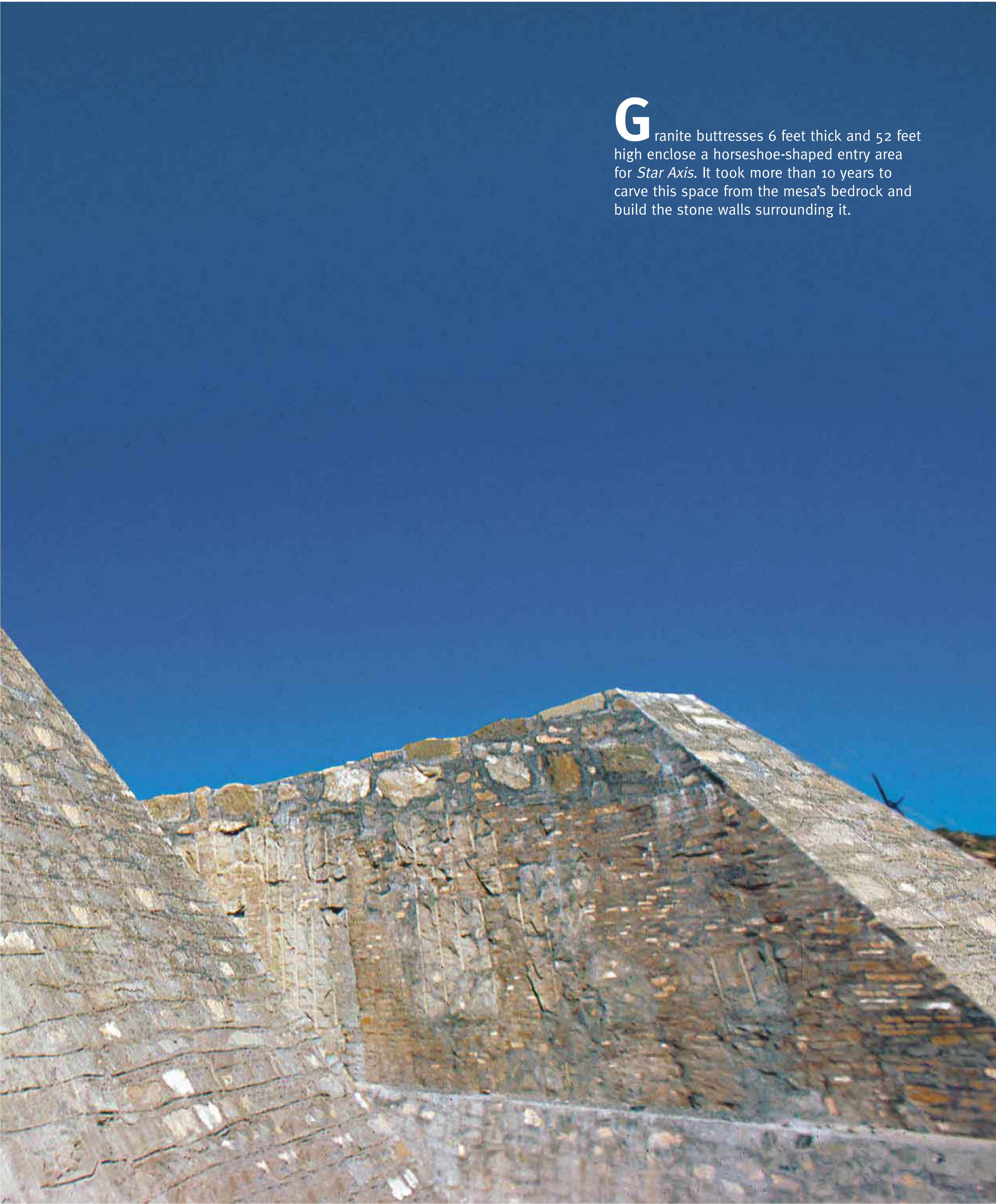
Photography by Charles Ross

With stone forms that spring directly from planetary and stellar geometry, the architectonic earthwork *Star Axis* helps us grasp the relationship between where we stand and what we see. The angles of its Solar Pyramid (left) were determined by the sun's position during the summer and winter solstices. In daytime, its shadow contracts and expands, tracking the shifting seasons.

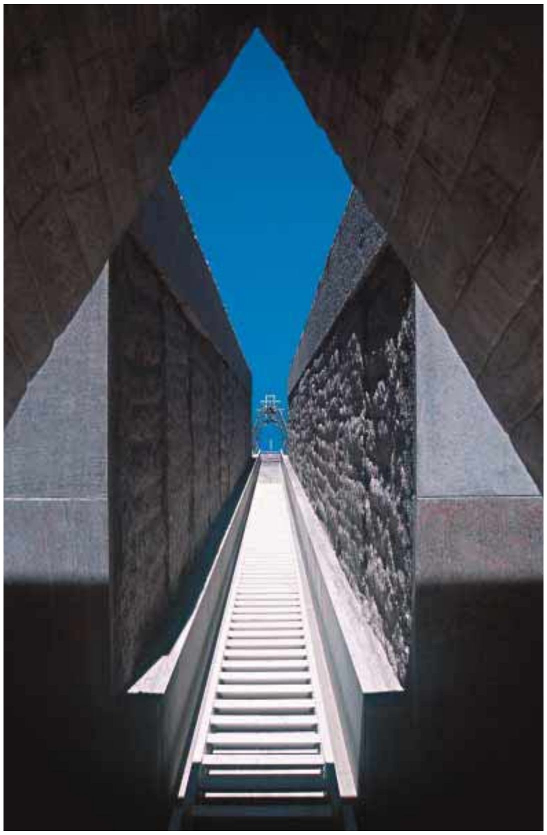




Tucked inside the Solar Pyramid sits the Hour Chamber, where visitors look through a 33-foot-high triangular portal to watch the stars slide by during one hour of the earth's rotation (above). Polaris, the North Star, is nestled in the 15-degree peak of the portal. A huge dome of sky opens up at the base of the Star Tunnel (right); the time-lapse photograph shows how the stars orbit Polaris in ever-widening arcs as night progresses.

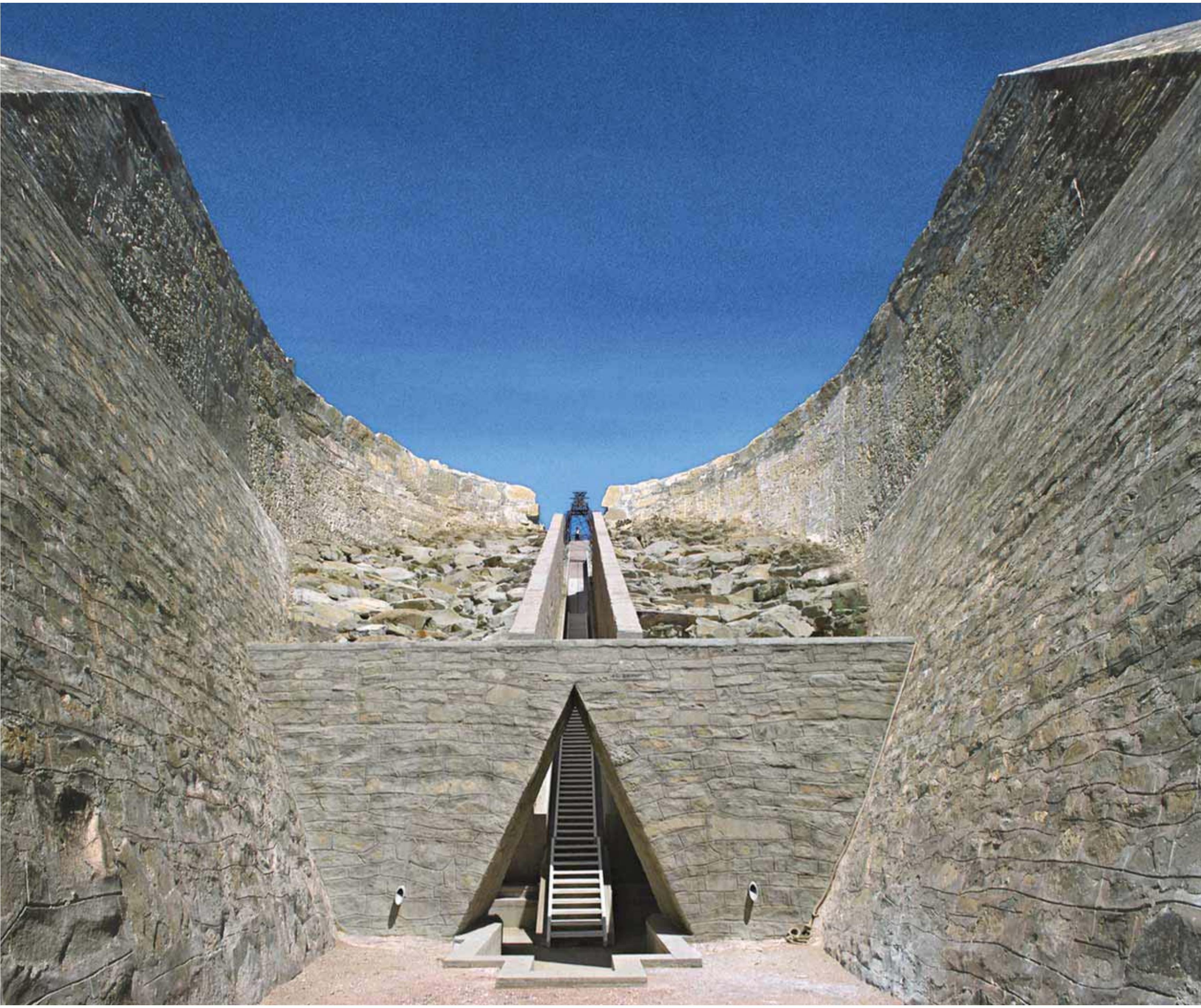


Granite buttresses 6 feet thick and 52 feet high enclose a horseshoe-shaped entry area for *Star Axis*. It took more than 10 years to carve this space from the mesa's bedrock and build the stone walls surrounding it.



In 1975, a young artist named Charles Ross bought a few acres of desert at the Chupinas Mesa in northern New Mexico and began planning an installation that would pay tribute to the timeless choreography of the heavens. His ambitious *Star Axis* is now nearing completion. Its central feature, a staircase called the Star Tunnel (above right), is parallel to the Earth's axis, which now points toward Polaris, the North Star. When finished, an aperture overhead will enclose a circle of sky the size of Polaris's orbit throughout different periods of Earth's precession, the phenomenon that causes our planet to wobble off axis as it rotates. Just check the dates marked on each stair as you climb, and when you look up you'll see where Polaris's path was (or will be). Ross has been building *Star Axis* bit by granite bit, conducting aerial surveys, topographic mapping, and astronomical calculations to align its features with the cosmos. Grand yet somehow intimate, *Star Axis* roots us firmly in the stark beauty of earth, sky, and stone.

The Star Tunnel intersects at a right angle with the Equatorial Chamber (opposite, left, and this page); from this vantage, you see which stars pass over the equator. Eventually the staircase will reach 11 stories into the sky and rise above the Solar Pyramid (visible at the top of the staircase, below).



From the ground up

As architects engage their work with the earth, a new kind of building emerges

1. **Chichu Art Museum**
Tadao Ando Architect & Associates
2. **Leventritt Shrub and Vine Garden**
Reed Hilderbrand and Maryann Thompson
3. **César Manrique Foundation Studio**
Palerm + Tabares
4. **Paul Klee Center**
Renzo Piano Building Workshop
5. **Connecticut Water Purification Facility**
Steven Holl Architects

PHOTOGRAPHY: COURTESY TADAO ANDO (1); © CHUCK CHOI (2); ROLAND HALBE (3); CHRISTIAN RICHTERS (4); PAUL WARCHOL (5)

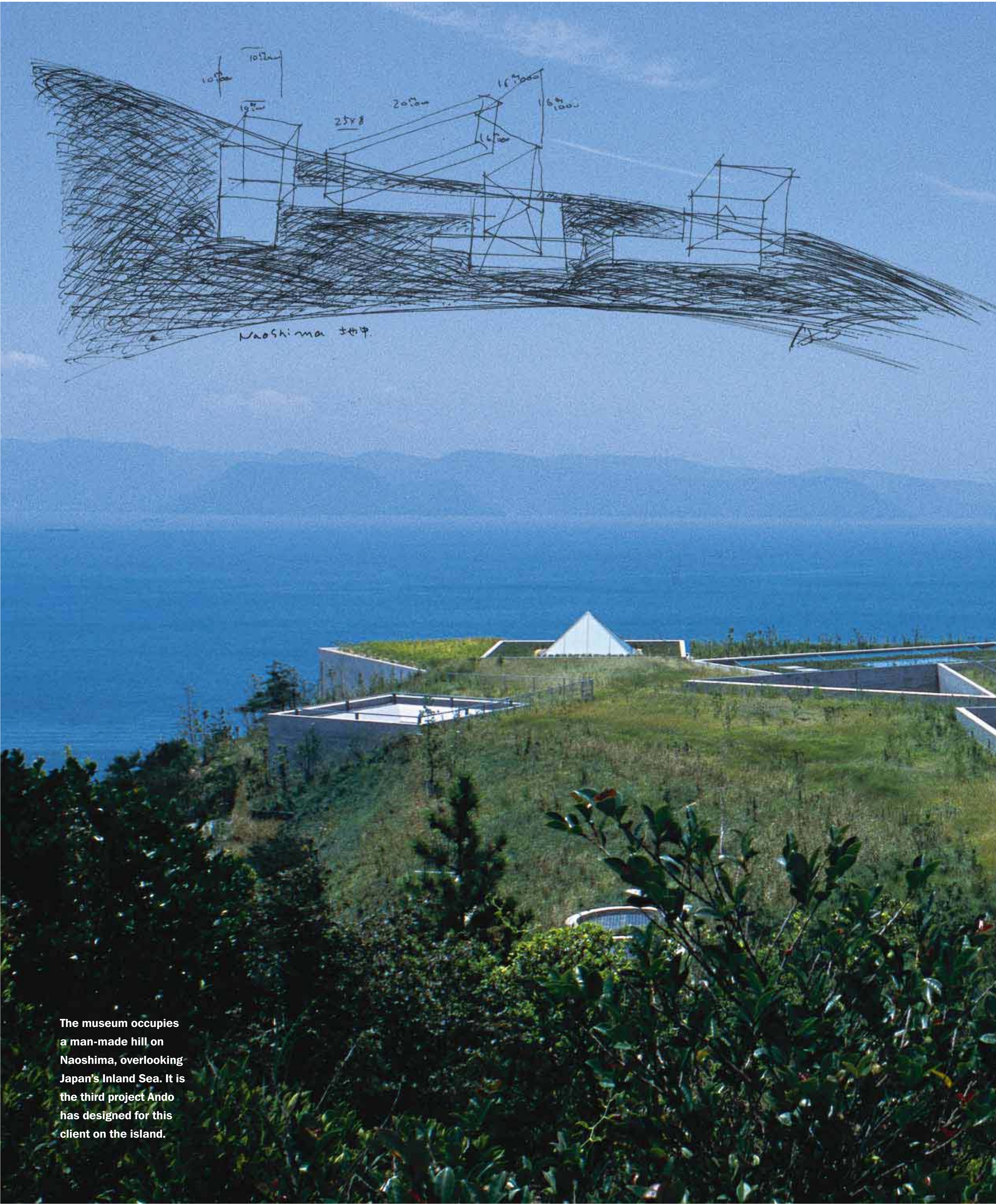
By Robert Ivy, FAIA

How, at a time when a natural waterborne cataclysm so completely overwhelmed human effort and human life, can we focus on architectural trends? Hasn't Hurricane Katrina ravaged our own sensibilities and energies?

The following pages, however, represent a development in architectural thinking that may prove eerily appropriate. By engaging their minds and work with the earth itself, a new generation of architects is paying unusual attention to the land, and to our relationship to the planet. This new architecture, occurring at the intersection of topography and geography, achieves almost primordial power by examining the way the world lies, then inserting architecture into and within the existing fabric—at once aware and respectful of natural demands.

Included in this section are projects that step down hillsides, slip into rolling contours, and bury into the landscape. A surprising photo essay documents a contemporary installation in the desert that achieves prehistoric forcefulness by aligning the Earth with the cosmos. The operative term for this new work is relationship, of earth to structure, structure to atmosphere, place to person.

While the underlying theory may seem abstract, even ethereal, the reality proves more solid and grounded. RECORD invites you to dig in.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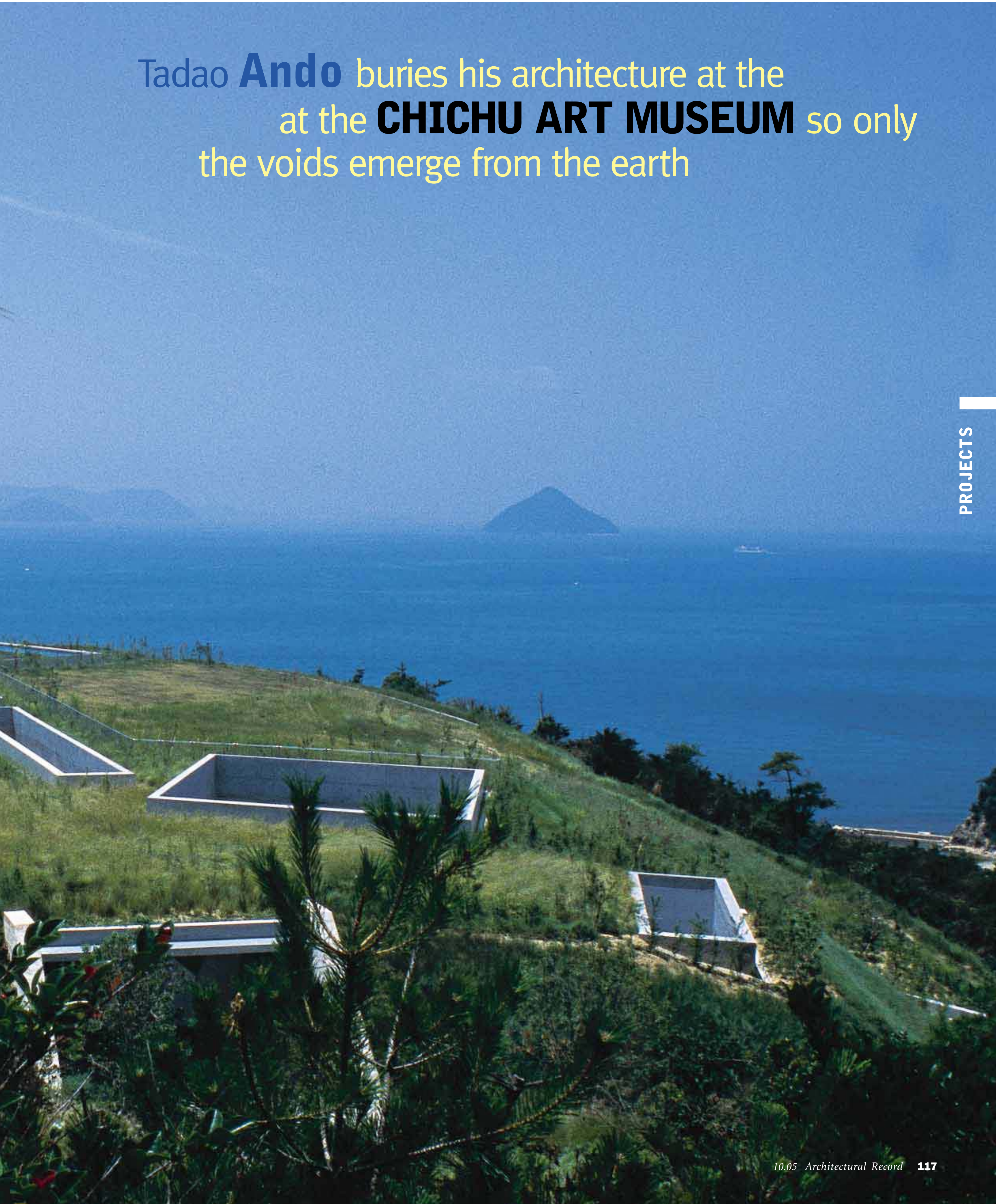
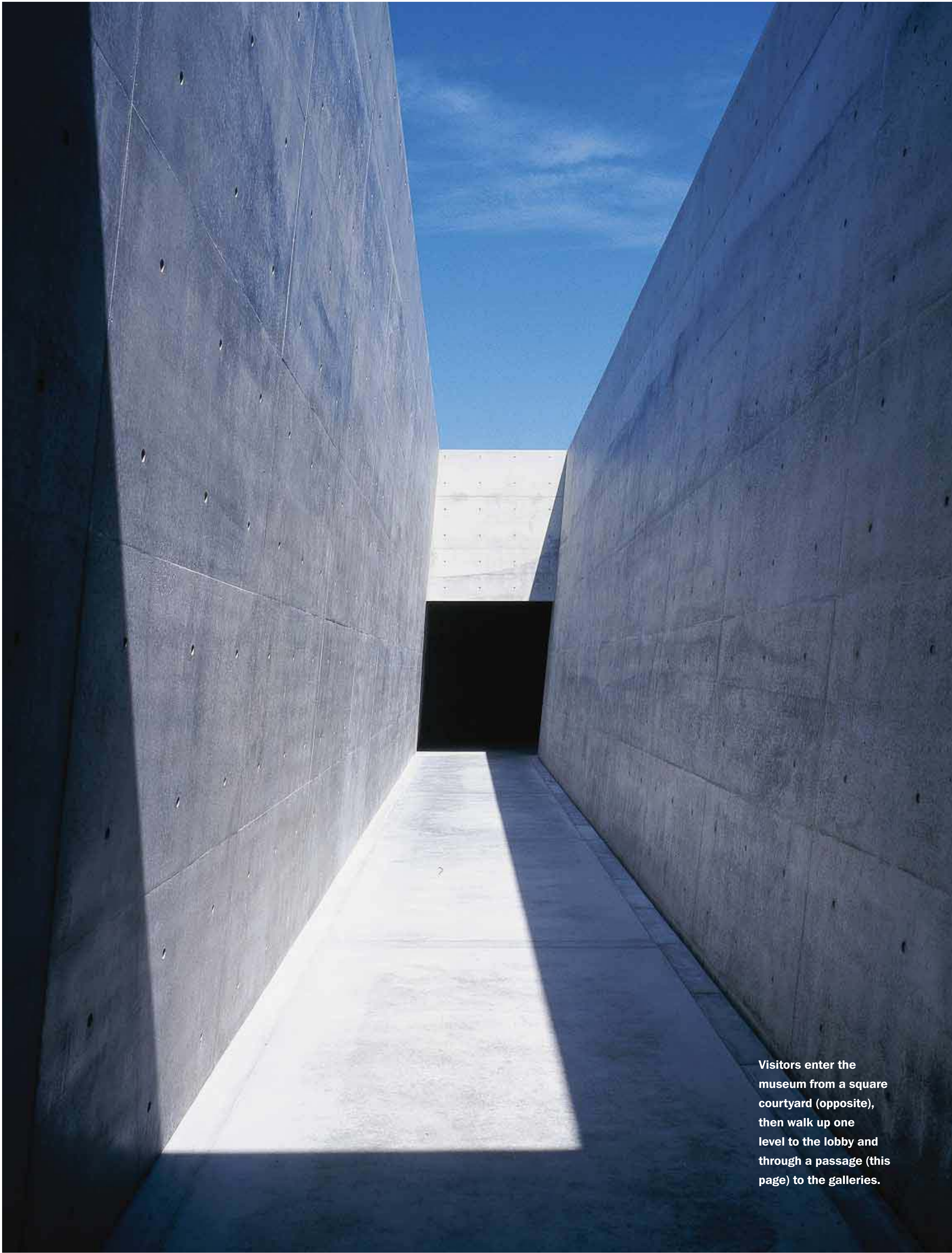
Naoshima 地中.

The museum occupies a man-made hill on Naoshima, overlooking Japan's Inland Sea. It is the third project Ando has designed for this client on the island.

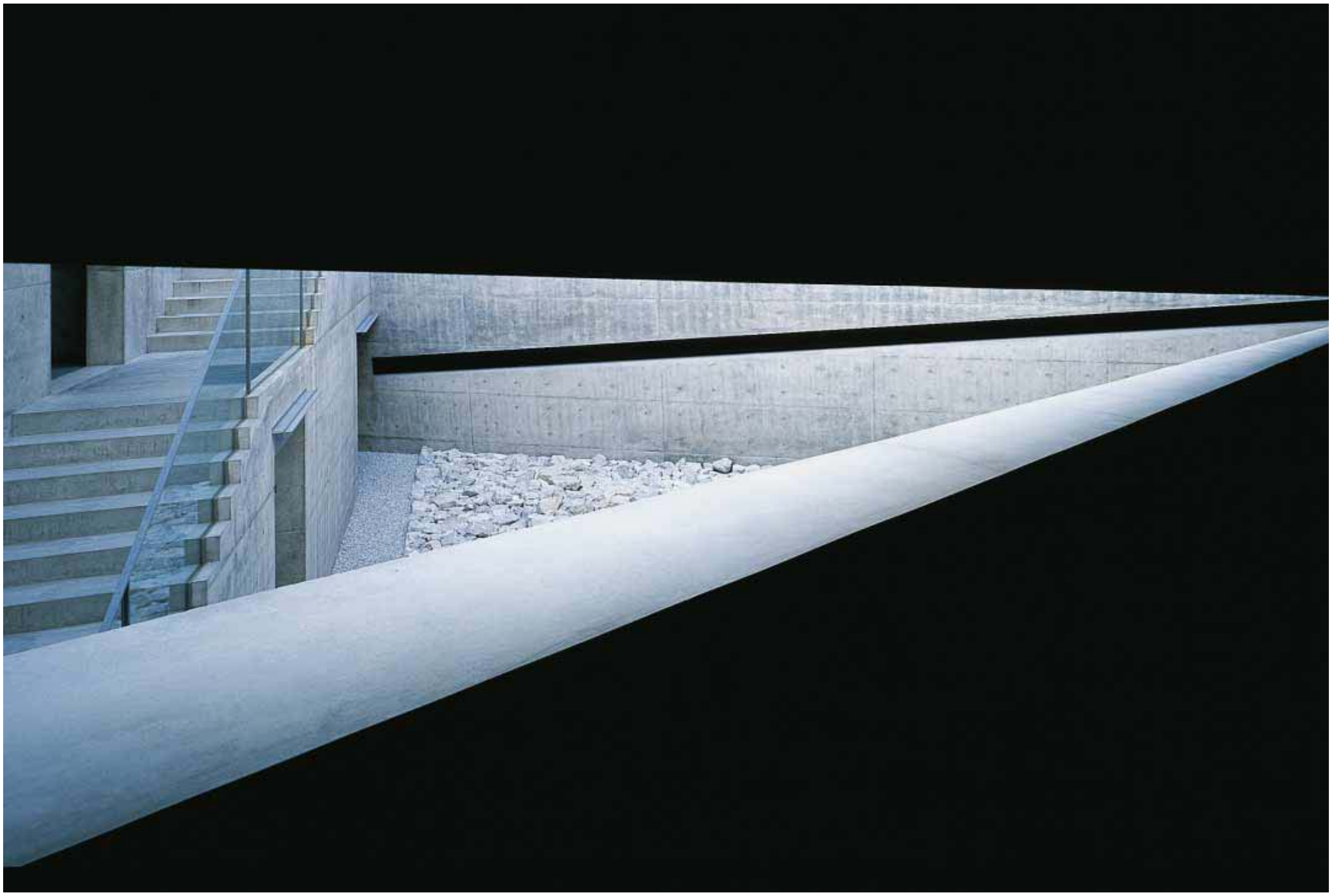
Tadao **Ando** buries his architecture at the at the **CHICHU ART MUSEUM** so only the voids emerge from the earth



PHOTOGRAPHY: © MITSUO MATSUOKA, EXCEPT AS NOTED; TADAO ANDO (FIRST SPREAD)



Visitors enter the museum from a square courtyard (opposite), then walk up one level to the lobby and through a passage (this page) to the galleries.



By Naomi R. Pollock, AIA

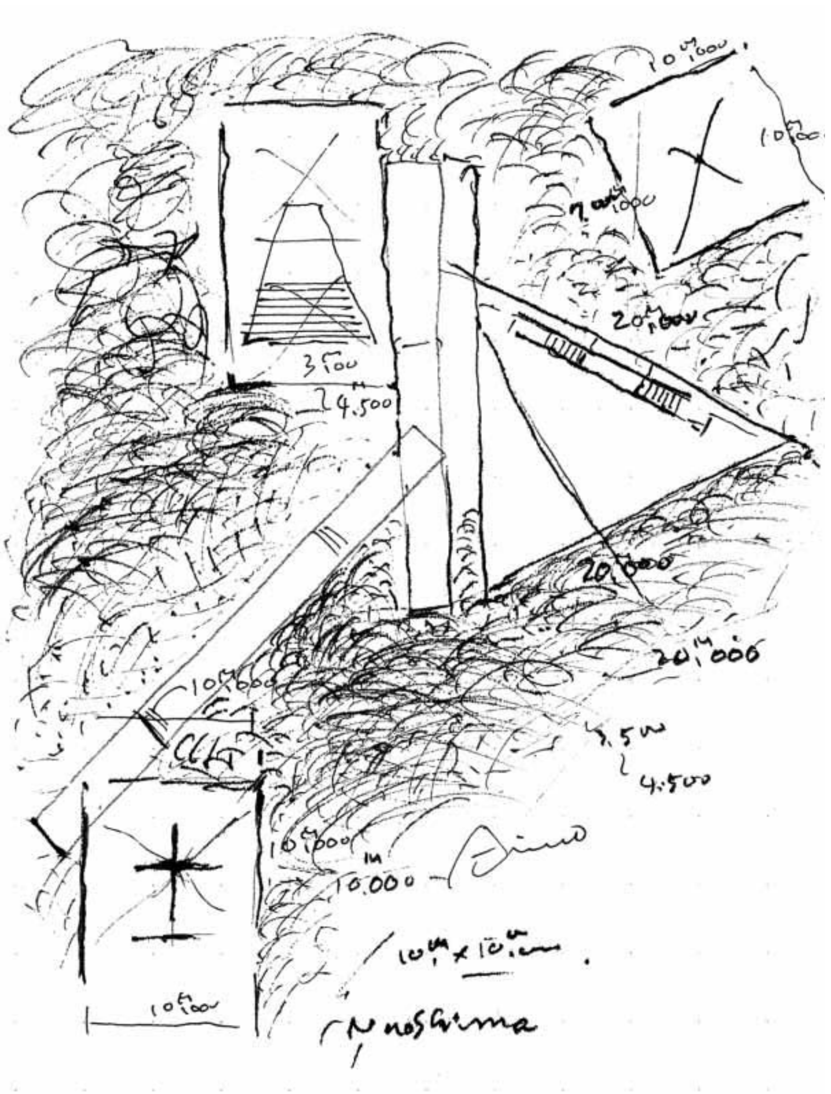
Tadao Ando's Chichu Museum represents a welcome return to the intense, small-scale work that first made the Osaka architect famous. In the same vein as his Church of the Light (completed in 1989 in Ibaraki, a suburb of Osaka) and other early projects, this sanctuarylike museum blocks out extraneous visual information and focuses attention on light and sky. Aptly named *chichu*, or "within the earth," the new museum is a collection of concrete volumes embedded in a hilly site overlooking Japan's Inland Sea. Privately owned by the Naoshima Fukutake Art Museum Foundation, the building features permanent installations of works by just three artists—Claude Monet, Walter De Maria, and James Turrell—each displayed in a self-contained gallery. The architect bound the galleries together with a labyrinthine sequence of spaces—light and dark, open and closed—serving as both passage and destination. Visitors journey to the museum's remote island to view the art, but they leave impressed with the powerful impact of Ando's architecture.

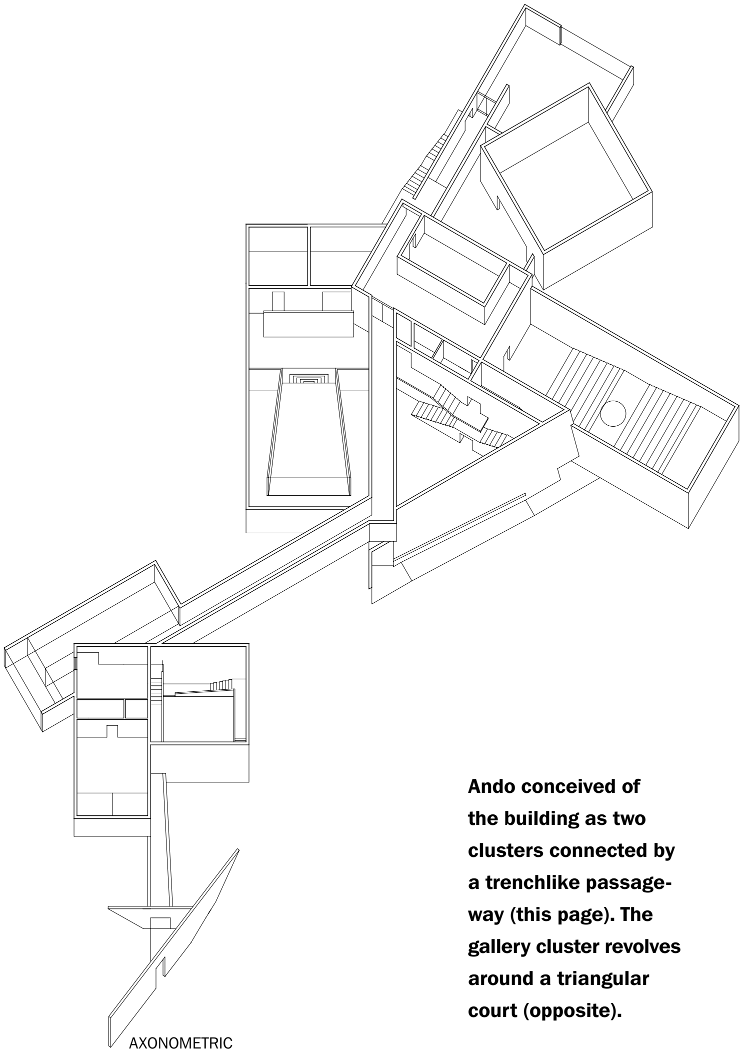
The museum sits on Naoshima, a 3.15-square-mile island southwest of Osaka. Accessible only by boat or ferry, the island is a throwback to another era. At its center, a castle town from the Edo Period (1603–1868) functions as a sleepy hub riddled with narrow streets and wood houses, some of which are now used for art installations. While a copper refinery dating from the Taisho Period (1879–1926) dominates the island's northern side, Benesse Corporation, a Japanese publisher of educational books and study aids, has been transforming the southern side into a cultural district with the help of Ando and other architects. The company first collaborated with Ando on the Benesse House/Naoshima Contemporary Art Museum, a combined gallery and hotel that opened in 1992.

Venturing less than half a mile from Benesse House, visitors approach the 27,700-square-foot, reinforced-concrete Chichu Museum along a ramped walk leading up to an opening in a semidetached concrete wall that slices across the hillside and serves as the building's entry facade. Once past the threshold, they find that sunlight disappears and a disorienting semidarkness takes over. Devoid of signage and other identifying features, a tunnel-like passageway separates the outside world from the museum's somber interior and leads to a sunken, square forecourt carpeted with green stalks of scouring rush, a segmented grass

Naomi R. Pollock, AIA, is RECORD*'s special international correspondent in Tokyo and the author of* Modern Japanese House*, published this month by Phaidon.*

Project: *Chichu Art Museum, Naoshima, Japan*
Client: *Naoshima Fukutake Art Museum Foundation*
Architect and engineer: *Tadao Ando Architect & Associates—Tadao Ando, Kazuya Okano, Kanya Sogo, design team*
General contractor: *Kajima Corporation—Ikumi Toyoda, Mamoru Satake, Yoshiki Urakawa, Sadanori Nishioka, project team*





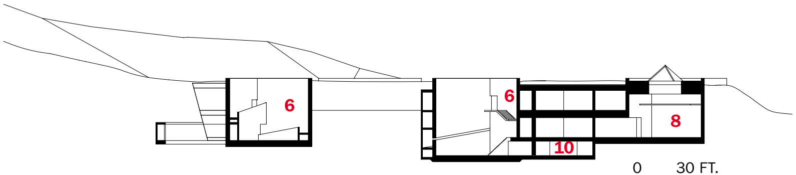
Ando conceived of the building as two clusters connected by a trenchlike passageway (this page). The gallery cluster revolves around a triangular court (opposite).

distantly related to bamboo. Like most traditional Japanese gardens, this one is for the eyes only. But as the walkway continues, it steps up and wraps around the courtyard perimeter, offering a variety of views of the greenery below. At the top, visitors enter the lobby but have to go outside again to reach the galleries.

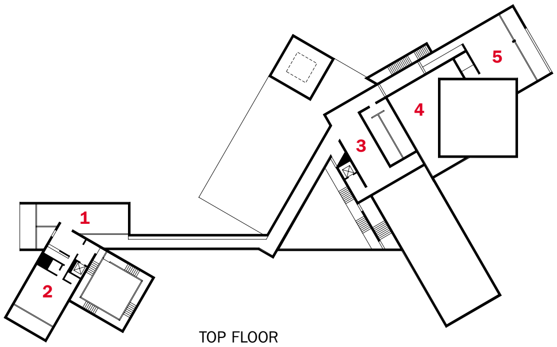
A second trenchlike walkway, this one exposed to the sky but defined on either side by tilting, concrete planes, leads to the heart of the museum: a triangular courtyard whose base forms the museum's lowest level, though its 98-foot-high sheer concrete walls enclose the museum's tallest space. Bracketed by the endless sky above and jagged chunks of limestone scattered over the floor below, the hollow core functions as a bold and arresting element inside the museum, yet is barely visible from the outside. Exterior stairs lure visitors down to the courtyard, which provides access to the De Maria gallery, while concealed ramped walkways—alluded to by diagonal slits in the walls—lead back up to the Turrell and Monet galleries. The museum's circuitous path culminates in a café where customers can dine refectory style at austere wooden tables designed by Ando, while gazing out at the sea and the city of Takamatsu across the water. Framed by a floor-to-ceiling picture window, the marvelous view connects the museum with its setting.

Like the circulation spaces, the galleries are meditative and inwardly focused. Ando's primary role here was to provide raw space for art, leaving the installation design to the individual artists (or the museum curator, in the case of Monet). Though the three exhibitions are very different, the artists' works have certain shared traits. De Maria's massive concrete stairs bathed in daylight, Turrell's mind-bending manipulation of artificial light, and Monet's soothing water-lily murals all have a strong architectural character, while relating, albeit abstractly, to nature as well. In addition, all three artists have prior connections to Naoshima. De Maria and Turrell had created installations on the island in 2000 and 1999, respectively. And the Monet paintings, purchased by Benesse's founder Tetsuhiko Fukutake some years ago, were the inspiration for the museum complex in the first place. Though the Impressionist masterpieces remain privately held, Fukutake's son, who now runs the company, thought they ought to be publicly displayed.

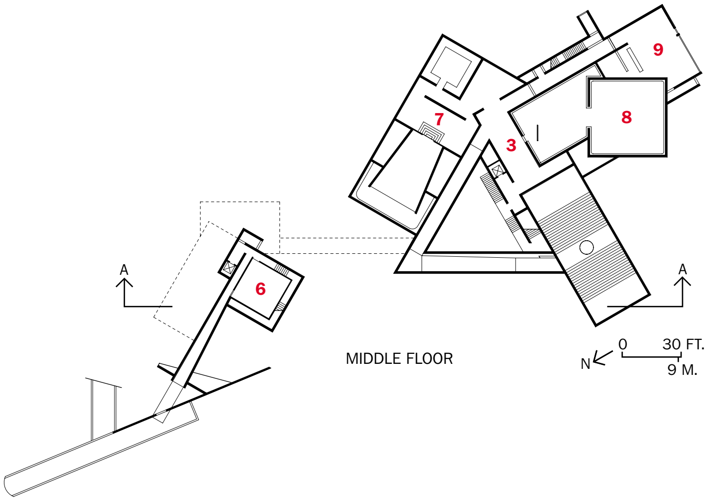
The question was how to do this. Though the gallery is underground, the museum curator felt the famous artworks should be shown as stipulated in the artist's writings: in daylight and as integral parts of a wall. The experience starts with an exchange of street shoes for cushioned slippers at the gallery entrance—an intimate act usually associated with entering a private home. Here it engages the body in the viewing experience and, on a more practical note, limits dirt from sullying the gallery's tile floor, composed of 700,000 milky white, marble cubes imported from Italy. Contrasting sharply with the smooth but hard-edged palette of glass, steel, wood, and concrete used elsewhere by Ando, this gallery's articulated floor surface, white plaster walls, and filtered, ambient daylight



SECTION A-A

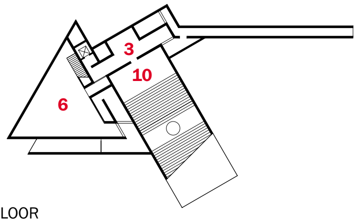


TOP FLOOR

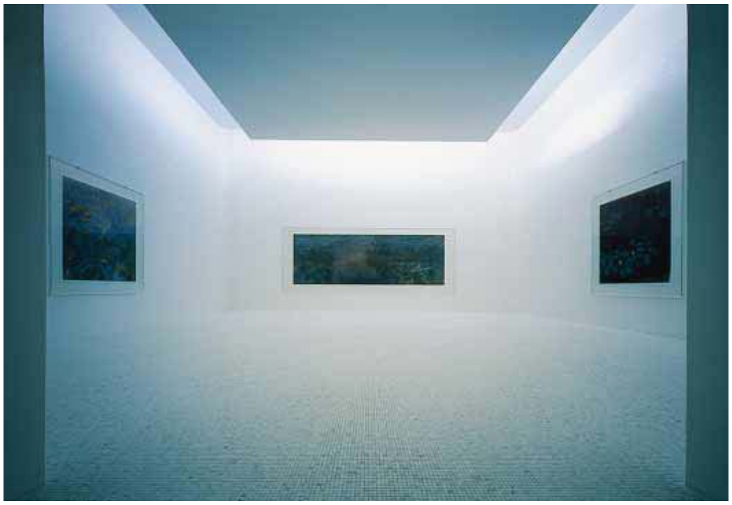


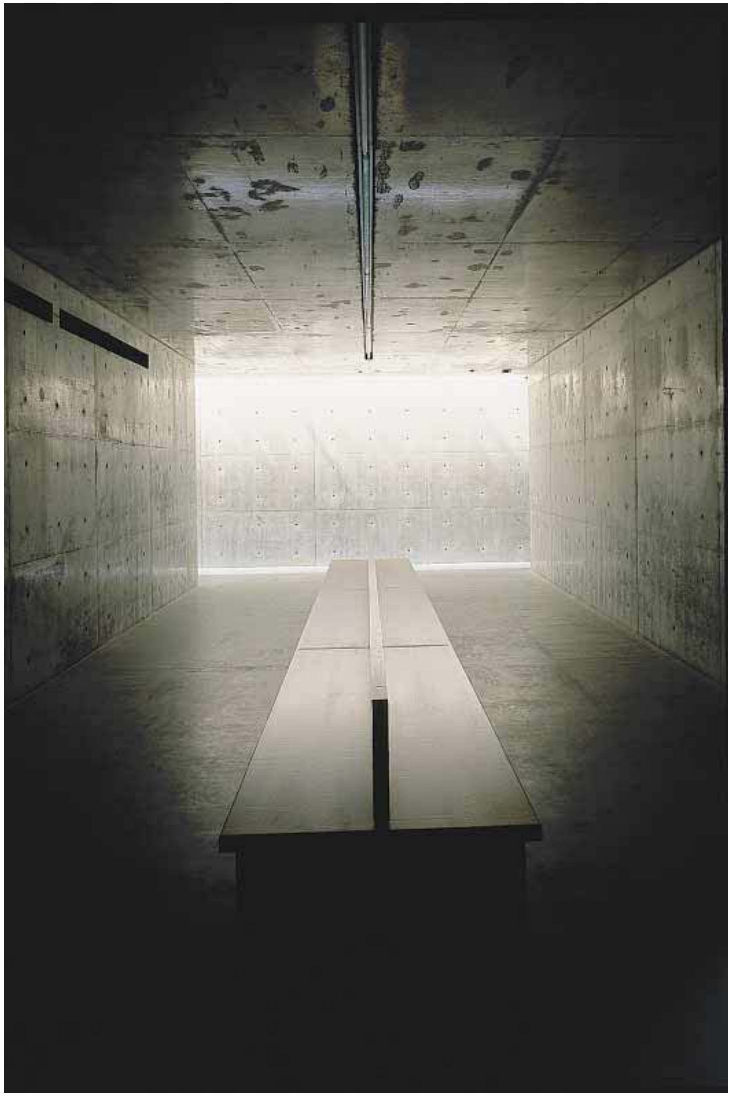
MIDDLE FLOOR

1. *Lobby*
2. *Office*
3. *Foyer*
4. *Mechanical*
5. *Director's room*
6. *Court*
7. *James Turrell gallery*
8. *Claude Monet gallery*
9. *Café*
10. *Walter De Maria gallery*



LOWER FLOOR





from above define the room's soft, muted atmosphere. Even the corners of the square space were gently rounded lest their sharp lines distract from the art. The only honed element in sight is a concrete bench designed by Ando but relegated to the gallery's entry vestibule. As Monet requested in his writings, the paintings are housed in high-precision, flush-mounted glass cases that also protect them from the ravages of room air saturated with saltwater.

While the museum proudly brings its Monet masterpieces to public attention, Ando hopes his building will eventually all but disappear. He envisions a time when plants and shrubs blanket its exposed surfaces so only the Platonic shapes of the courtyards and skylights are visible from above. "Both previous designs for the Naoshima Contemporary Art Museum and its Annex have reflected my idea of half-burying the buildings underground, out of consideration for the landscape," explains Ando. "Here, the method is pushed even further by submerging the building's entire volume below the ground." By pursuing this strategy, Ando has done something remarkable: create monumental space without the monumentality. ■

Sources

Windows and doors: *Techno Namiken*

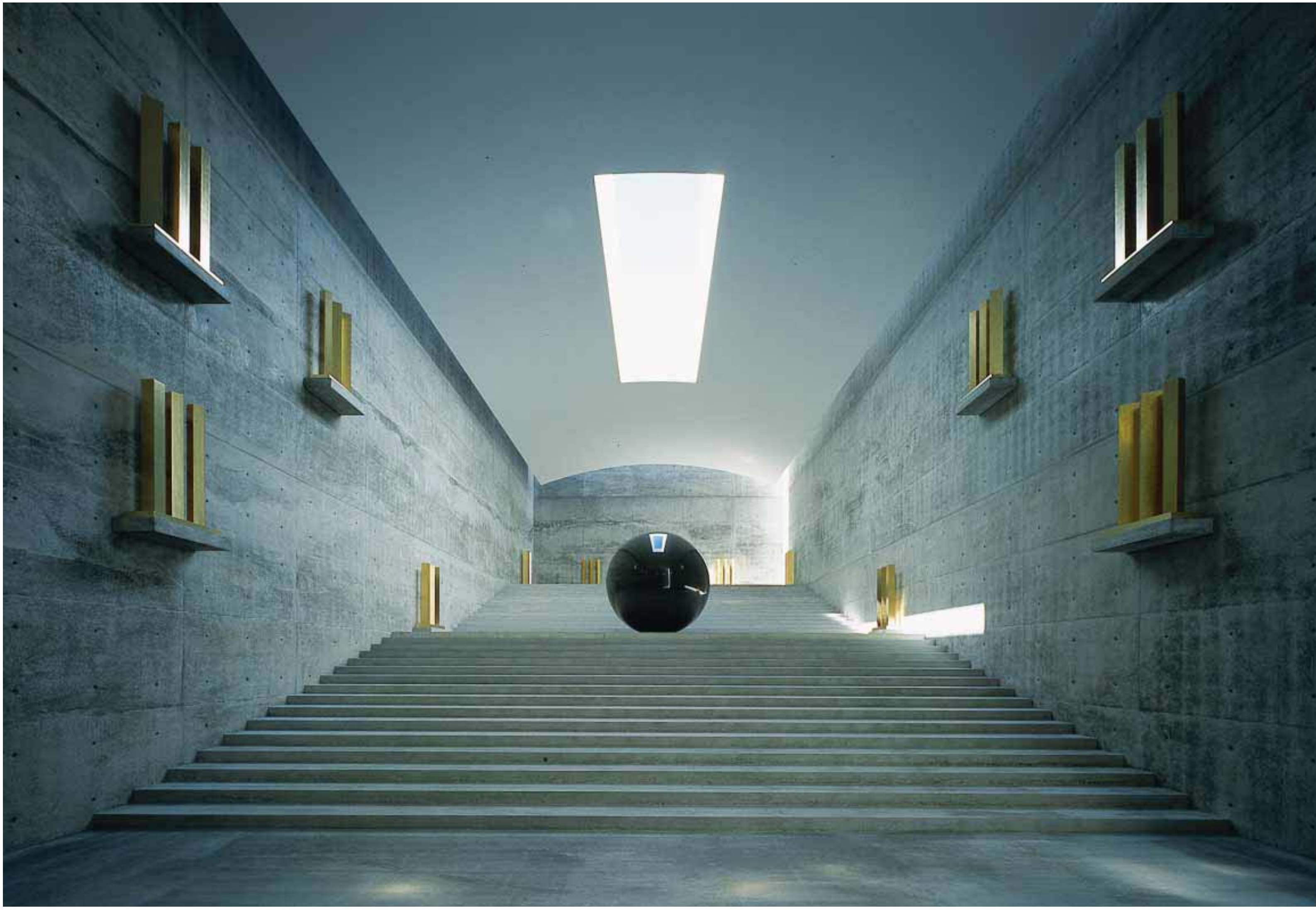
Skylights: *Hokuriku Alcon*

Hardware: *Fuji High Technics*

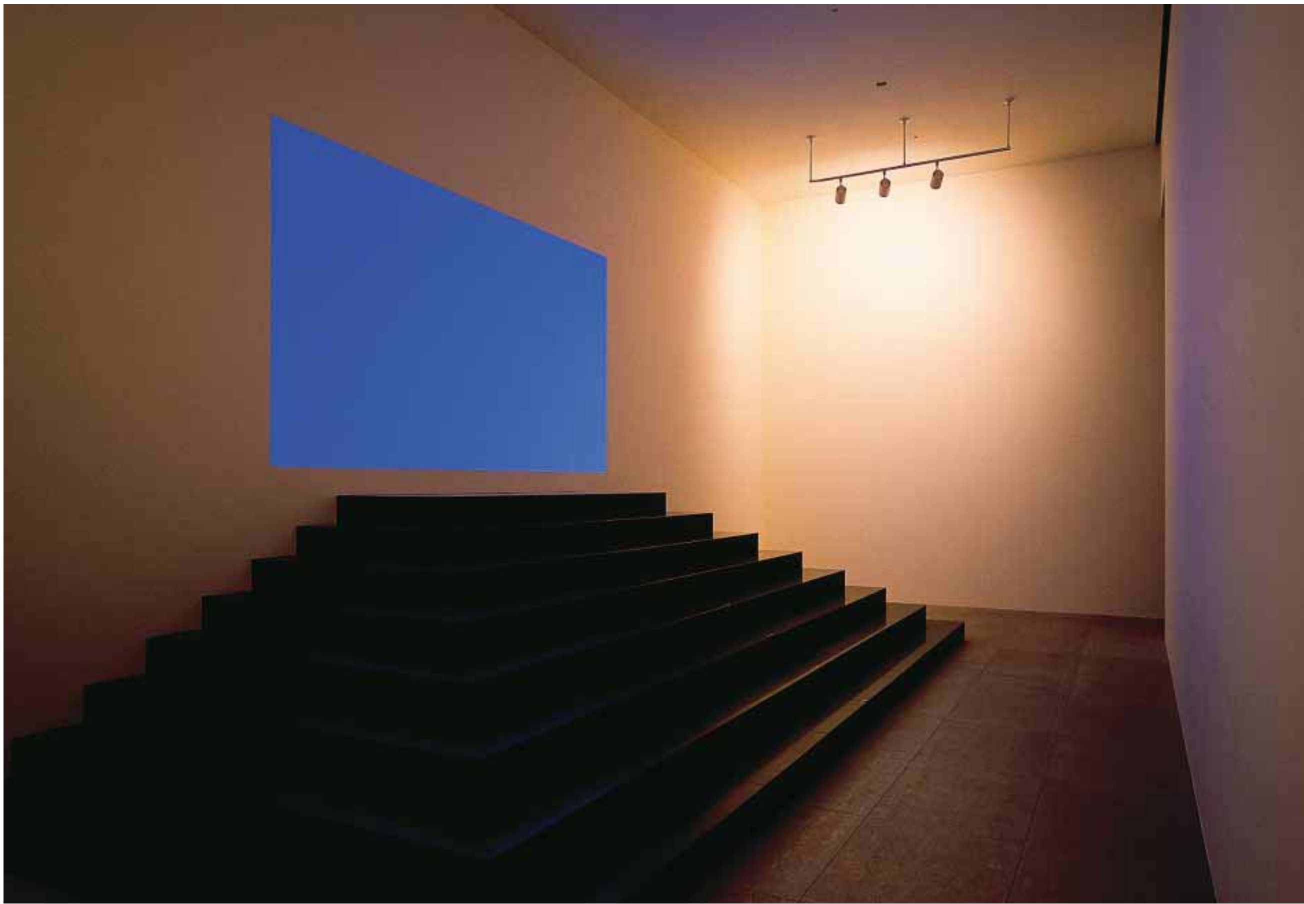
Millwork: *Suminoe Kogei*

Chairs: *Cassina*

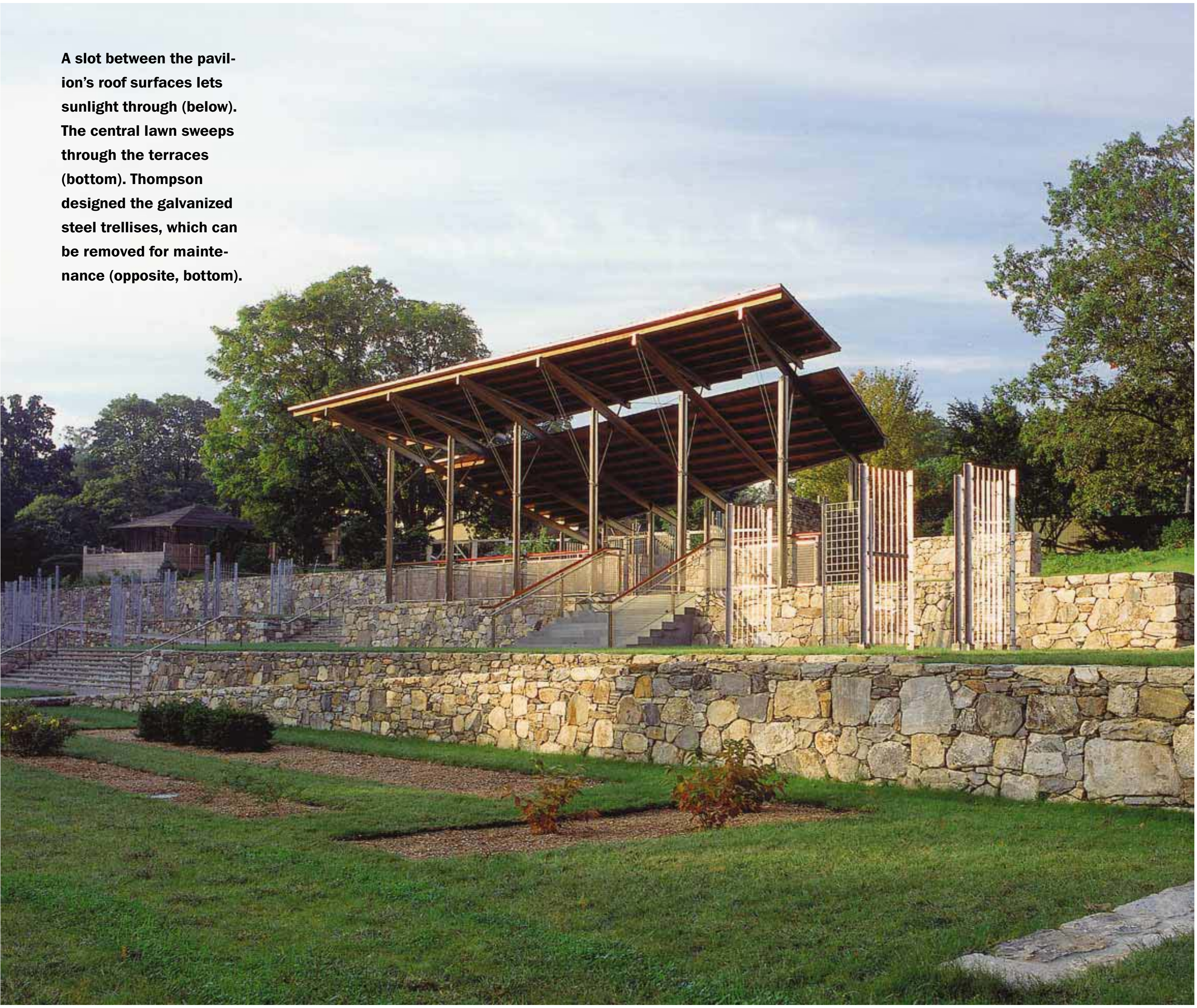
For more information on this project, go to Projects at **www.archrecord.com**.



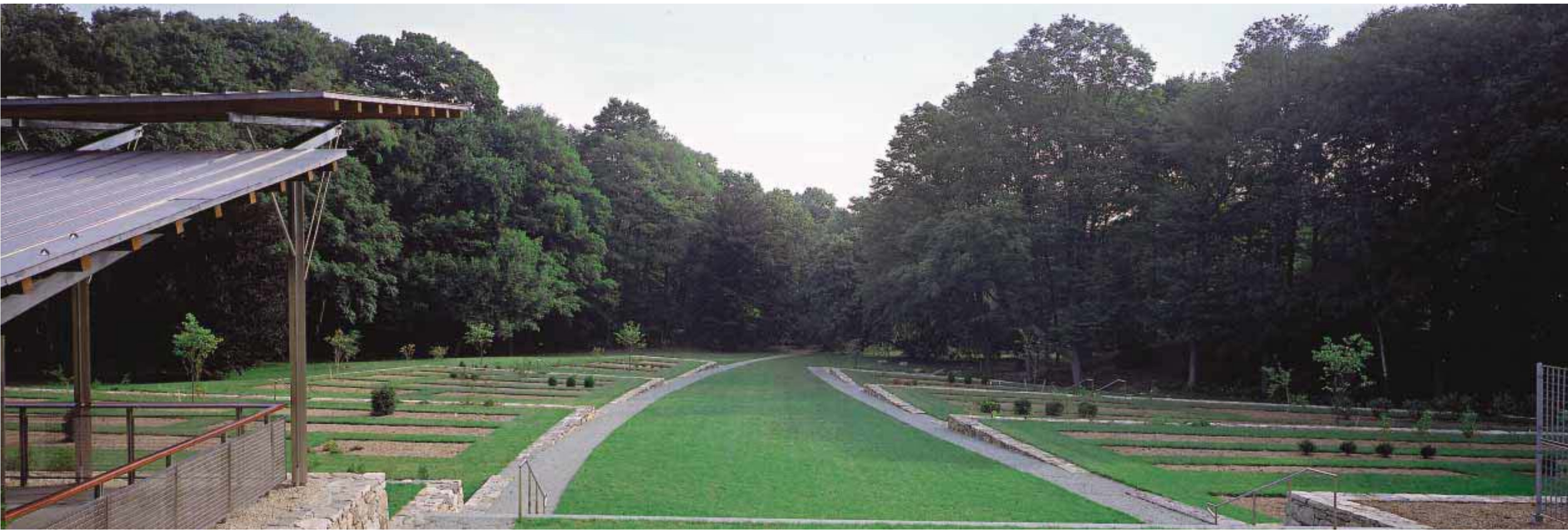
Ando manipulated light and darkness to draw people through the museum's circulation areas (opposite, top). Each of the three artists represented in the museum has space devoted just to his work: Walter De Maria's *Time/Timeless/No Time* (above), James Turrell's *Afrum, Pale Blue* (right), and Claude Monet's *Water Lilies* (opposite, bottom).



A slot between the pavilion's roof surfaces lets sunlight through (below). The central lawn sweeps through the terraces (bottom). Thompson designed the galvanized steel trellises, which can be removed for maintenance (opposite, bottom).



PHOTOGRAPHY: © ALAN WARD, EXCEPT AS NOTED

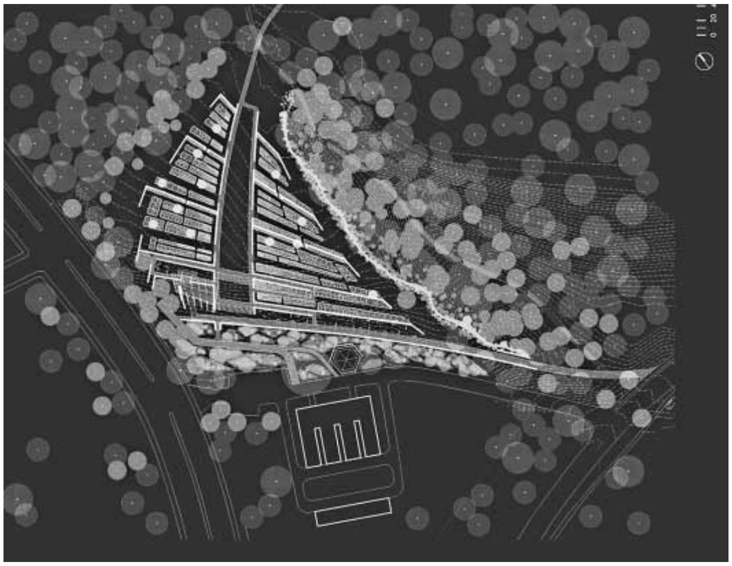


Reed Hilderbrand and Maryann Thompson join forces for the new LEVENTRITT SHRUB AND VINE GARDEN in Boston

By Deborah Snoonian, P.E.

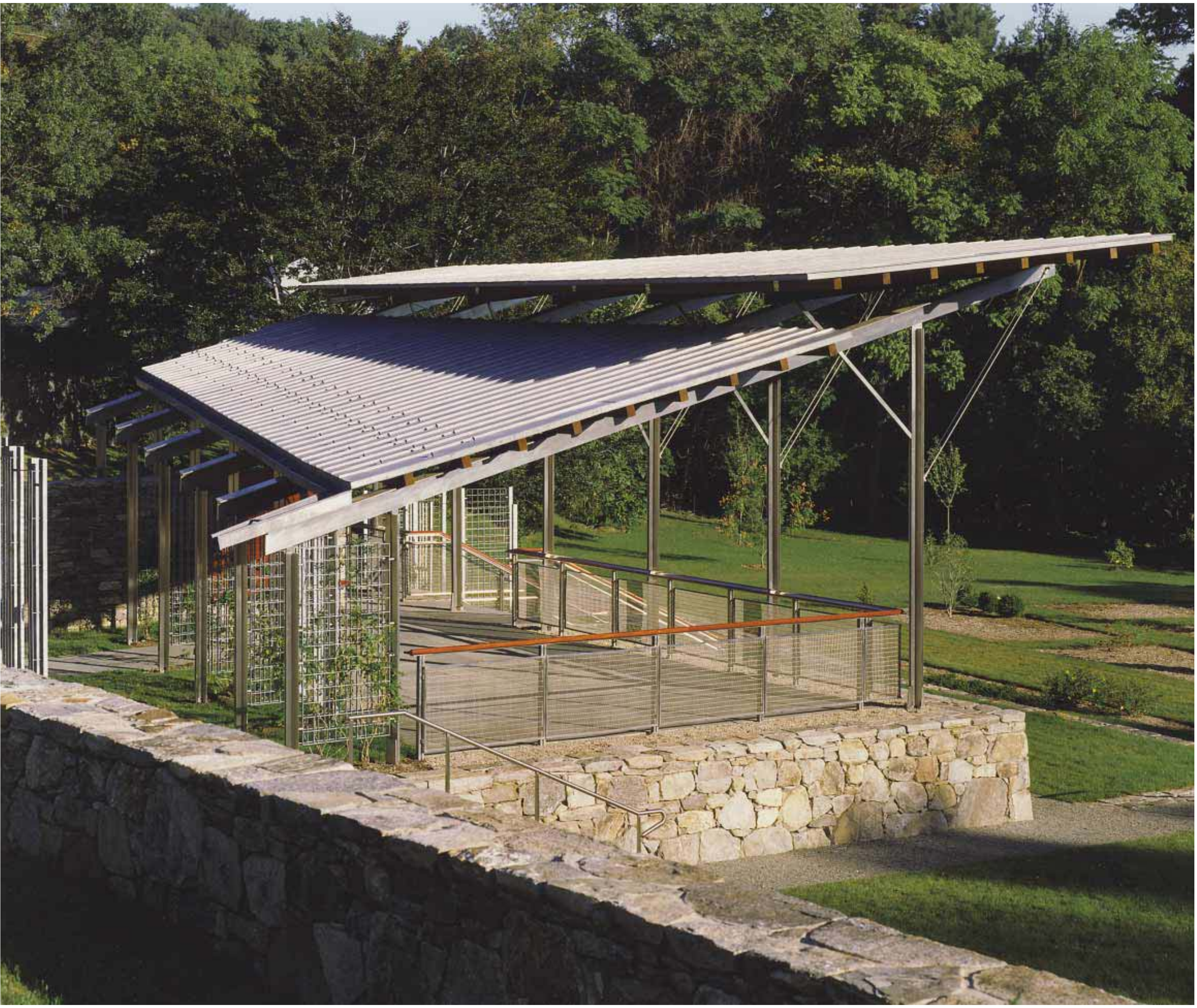
Being tapped to design a garden for plant experts sounds as daunting as cooking a holiday meal for Julia Child and Jacques Pépin, but Glen Valentine, a project manager with landscape architect Reed Hilderbrand in Watertown, Massachusetts, describes working with Harvard University's Arnold Arboretum as a partnership of complementary strengths. "The client was demanding about the horticultural requirements, which makes sense—plants aren't just ornaments to them, they're the lifeblood of their institution," he says. "But they fully supported our ideas for creating a framework for their new collection." He's talking about the Leventritt Vine and Shrub Garden, which Reed Hilderbrand designed with Maryann Thompson Architects of Cambridge, Massachusetts. Though clearly Modern in character, this green oasis in Boston's Jamaica Plain neighborhood nevertheless feels as timeless and classic as a string of pearls (or steak tartare, to continue the metaphor).

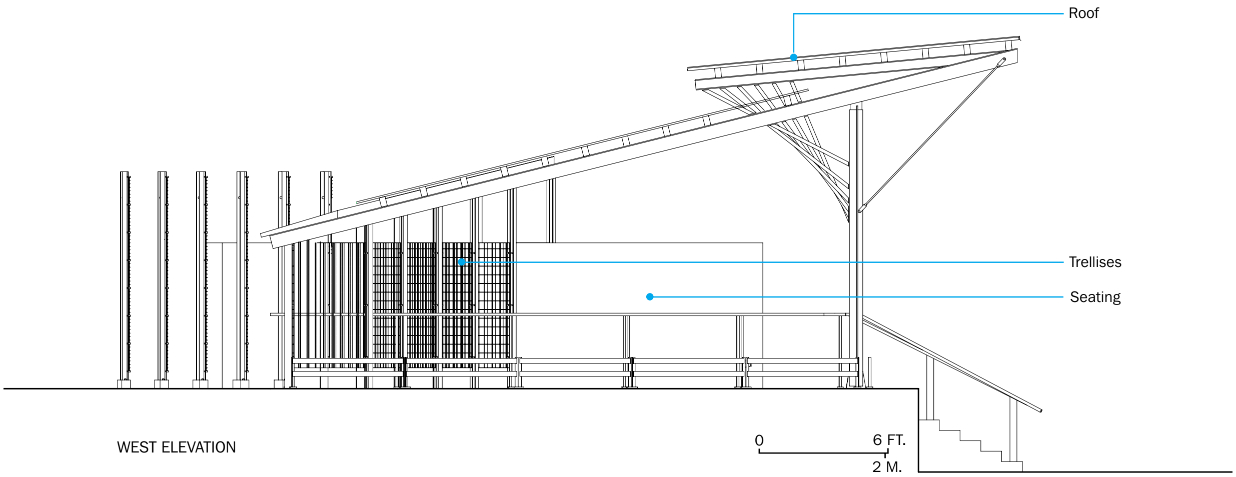
Founded in 1872, the Arnold Arboretum comprises 265 acres of Boston's 7-mile-long Emerald Necklace, and was designed by Frederick Law Olmsted and Charles Sprager Sargent, the arboretum's first director. Harvard set aside a 3.5-acre parcel for planting vines and shrubs that are difficult to grow or care for elsewhere on the grounds. The design team they tapped had worked together congenially on other projects, and this one proved no different. "Our aesthetic sensibilities are very similar, and we share ideas freely," says Thompson.



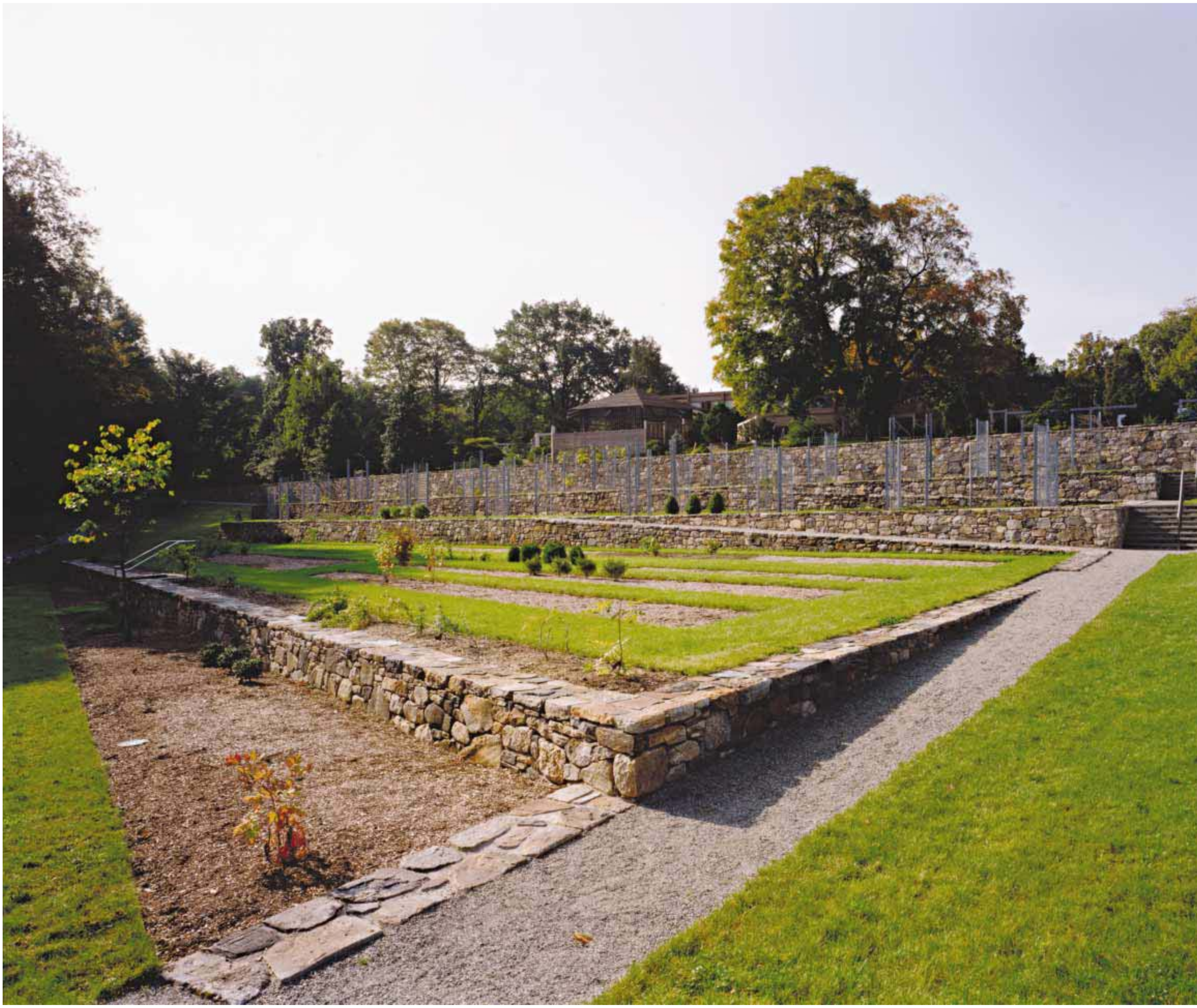
The site (above), shaped like a blade of a pinwheel, drops 30 feet toward its northernmost point and is bounded on the east by a stream. The arboretum needed a flexible classroom space and gathering spot as well as a garden, so Thompson placed an open-air pavilion at the southwest corner of the slope that opens up expansively to the plantings below. Unlike traditional botanical gardens, Reed Hilderbrand eschewed a rigid symmetrical plan or arbitrary geometric construct around the pavilion. Instead, he laid out rows of wide terraces that slide and fan their way down the sloped terrain. A central processional lawn cuts through them at

Project: *Arnold Arboretum Leventritt Shrub and Vine Garden, Boston*
Architects: *Reed Hilderbrand Associates (landscape); Maryann Thompson Architects (pavilion, trellises, stone walls)*
Engineers: *Arup (structural); Vanasse Hangen Brustlin (civil); Haley & Aldrich (geotechnical)*
General contractor: *Lee Kennedy*




Roof
Trellises
Seating
WEST ELEVATION
0
6 FT.
2 M.

The pavilion's angled roof surfaces mirror the planted terraces (above). Local fieldstone used for a retaining wall and throughout the garden adds a dimension of permanence and serenity (opposite).



PHOTOGRAPHY: © CHUCK CHOI

a grade gentle enough for handicapped access. "We wanted the natural form of the land to dominate the feel of the garden," says Valentine. Maintenance equipment can be maneuvered easily through the terraces, and the plants climb trellises of steel, designed by Thompson, that can withstand the viselike grip of woody vines and shrubs without warping.

The tranquil landscape belies what was a behemoth effort to replace half the site's fill with a special mix of soil that could nourish the plants, and aptly disguises a complex irrigation and drainage system. Nary a sprinkler head nor an errant hose detracts from the setting.

It's best to enter the garden from the east, at the base of the 600-foot-long fieldstone wall that forms the site's southern backbone. The wall rises to 7 feet in height, drawing you into the garden and establishing a sense of intimacy and enclosure despite the hum of nearby traffic. This pathway leads directly to Thompson's pavilion, a simple structure with a stone floor and brushed-stainless-steel beams and columns supporting a tongue-and-groove cedar roof overlaid with copper. The shifting geometry of the struts and columns evokes the branches of vine structures growing all around, and its juxtaposition of man-made and organic materials is an apt metaphor for a curated collection of plant life.

Far from being just a resource for the arboretum, the Leventritt Garden is the most significant addition to Boston's public park system in many years. Reed Hilderbrand and Thompson have added their own sculptural jewel to Olmsted's Emerald Necklace, one clearly poised to stand the test of time. ■

Sources

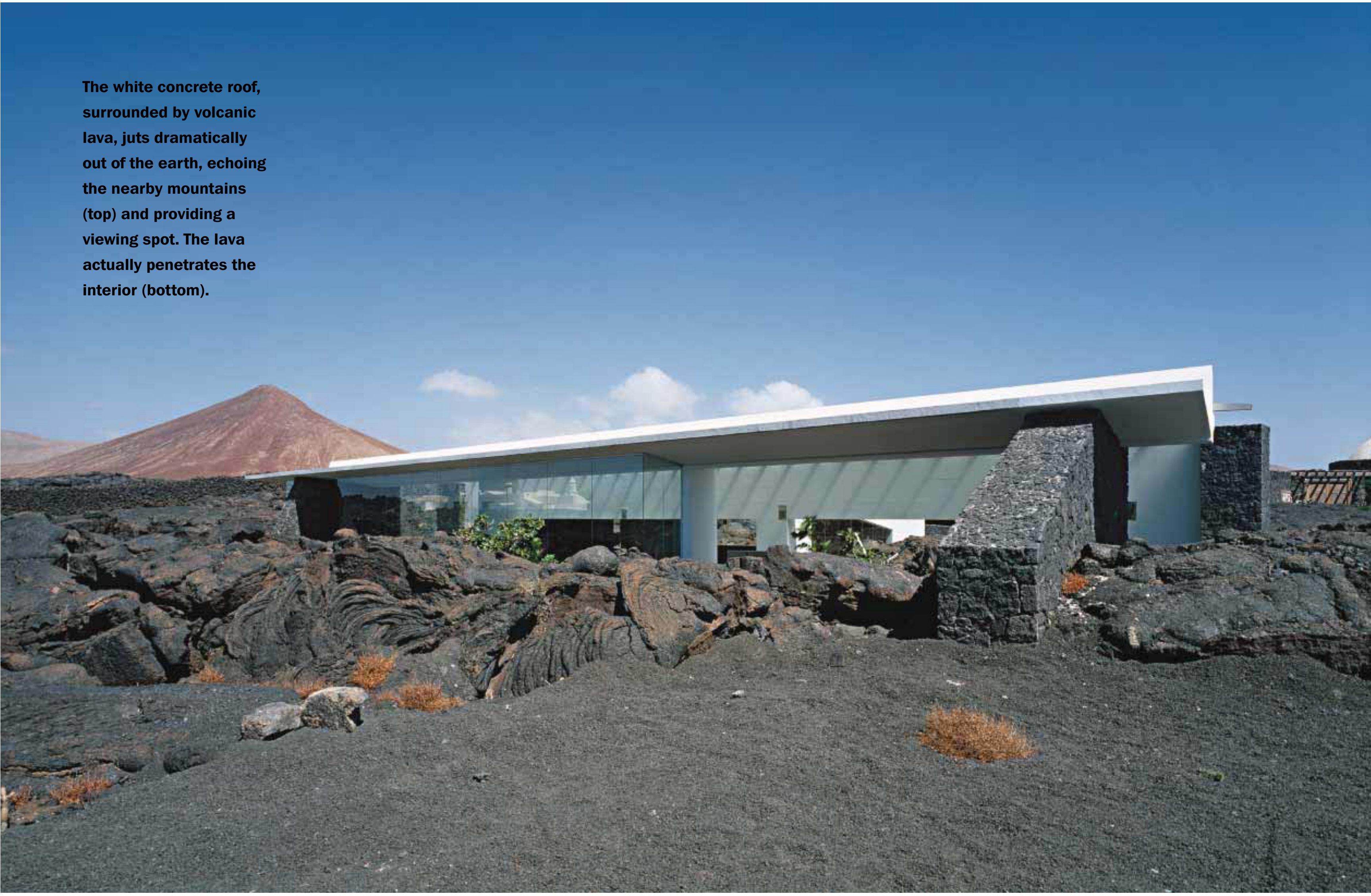
Stainless-steel columns, railings, and beams: *Ironcrafters*

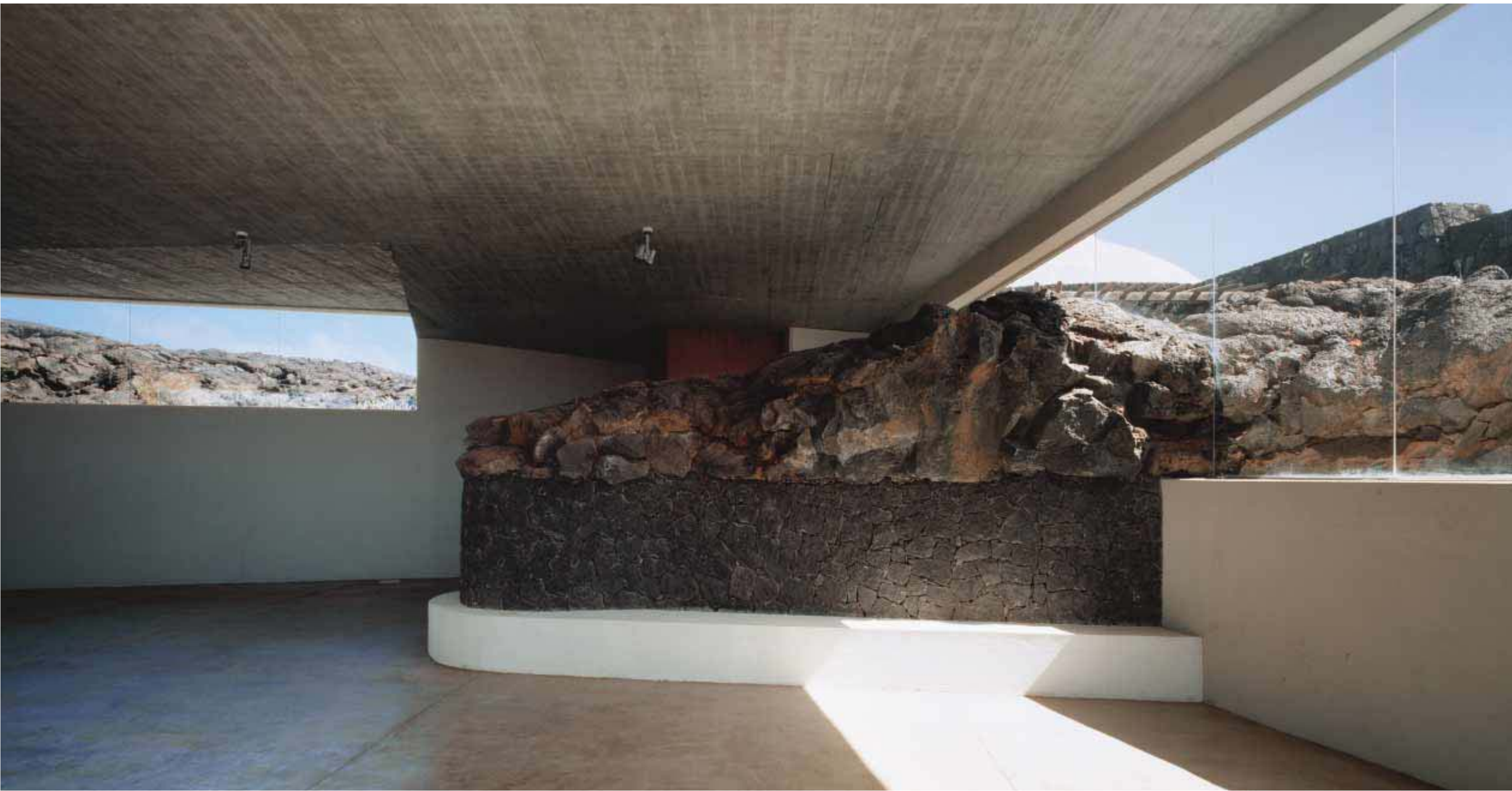
Fieldstone and stonework: *M&F Masons*

Irrigation: *Irrigation Consulting*

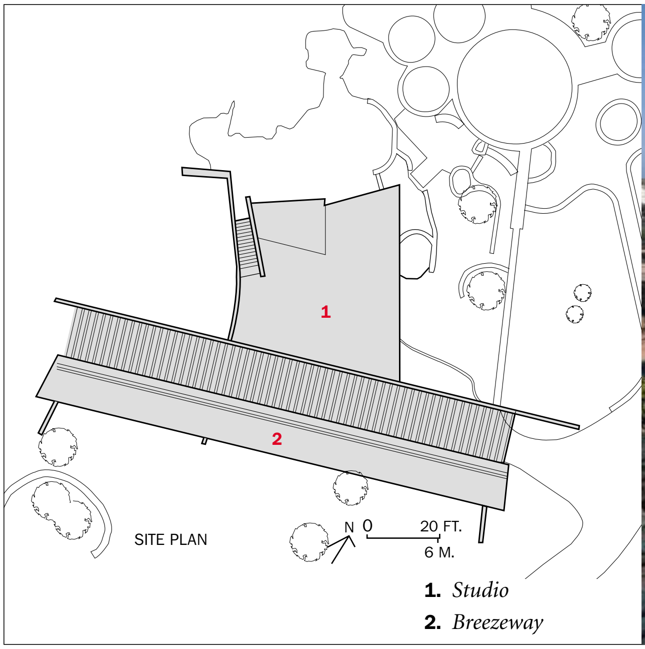
For more information on this project, go to Projects at **www.archrecord.com**.

The white concrete roof, surrounded by volcanic lava, juts dramatically out of the earth, echoing the nearby mountains (top) and providing a viewing spot. The lava actually penetrates the interior (bottom).

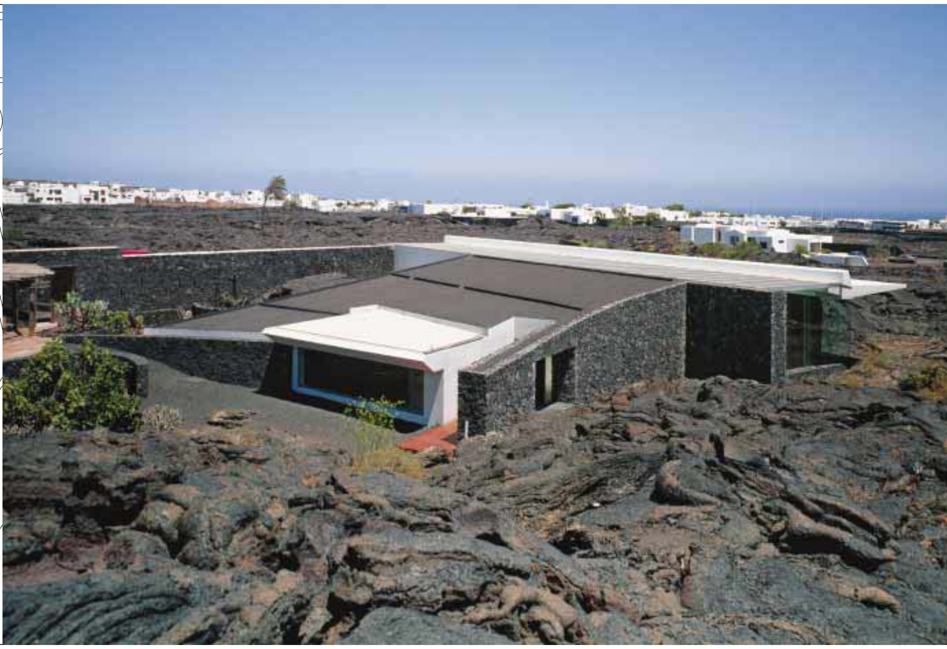




Palerm + Tabares creates the illusion of earth flowing through architecture with its **CÉSAR MANRIQUE FOUNDATION STUDIO** in the Canary Islands



1. *Studio*
2. *Breezeway*



By Sam Lubell

A landscape of relatively fresh lava (dating from 18th-century eruptions) that looks like the surface of the moon against a backdrop of volcanic mountains and a sparkling ocean offers, to say the least, an amazing spectacle. In designing a studio space for the César Manrique Foundation's artist-in-residence program in Lanzarote, the Canary Islands, Spanish architects Leopoldo Tabares and Juan Manuel Palerm sought to enhance the impact of this setting in order to inspire the painters and sculptors who come here for about a month each year.

Deferring to this context, the firm merged the building with its surroundings by placing most of the structure below ground. It clad many of the reinforced, poured-in-place concrete walls and piers with volcanic stones, and brought the surrounding topography into the studio. The architects also expanded the views via floor-to-ceiling windows and a strikingly angled concrete roof that acts as an observation deck. The design, rooted in a Modern aesthetic, intentionally departs from the closed, discrete, colonial-style architecture of the museum and main headquarters only a few feet away.

César Manrique, a painter, sculptor, and architect who was known for embracing the land with his jagged-edged art, started the private cultural foundation in 1982. The foundation headquarters and museum, completed in 1992, just before Manrique's death in a car crash, blends with the volcanic landscape, and is clad in many places with local stones and constructed between the empty spaces in the lava. Its traditional Lanzarote aesthetic of blocky forms and smooth walls, rendered in white stucco, is enlivened with quirky touches.

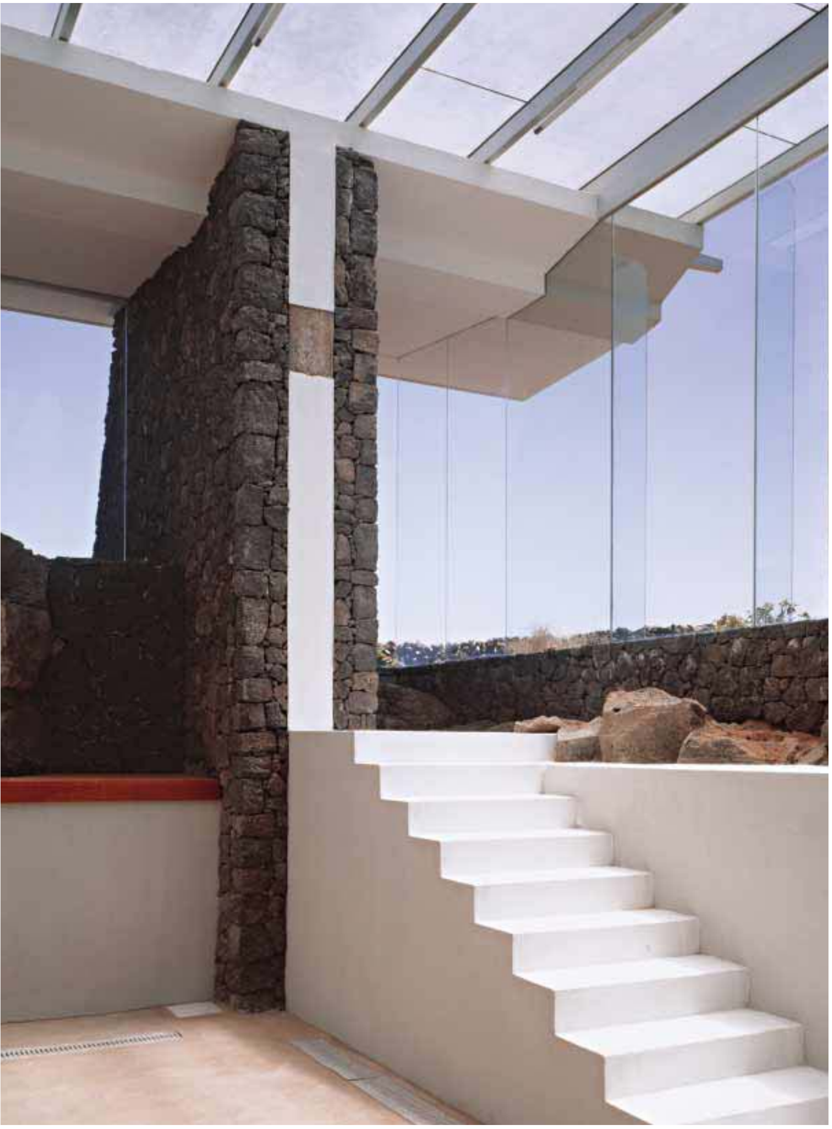
Tabares and Palerm, who adhere to a spare, simple architectural design approach, had to convince the foundation to forsake its initial desire for something more traditional. "We work in a Modernist style because it reflects us, not somebody else," says Tabares, whose firm is located in nearby Tenerife.

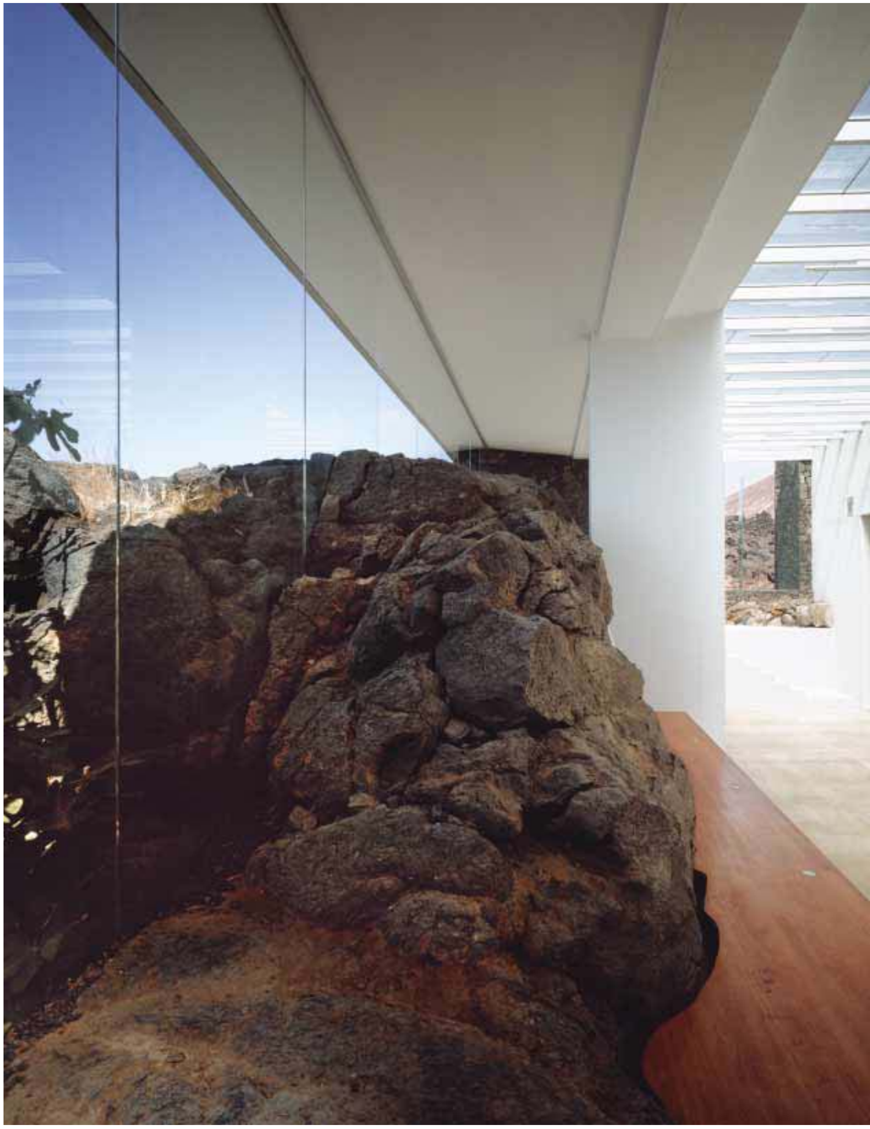
Another challenge remained: Because of environmental and safety issues, local zoning prohibits new building in the area. Fortunately, the lot where the studio is located, once intended for the foundation's pool, had long been abandoned. Still, it took many months of discussion for the local authorities to allow this type of construction to take place there.

By digging into this lot, and by annexing a small amount of adjoining property, the design team was able to create a 165-foot-long, T-shaped structure. The house, with a spacious, open floor plan, is horizontal, visually mingling with the land, although its ceilings are high—16 feet tall—to accommodate the eventual addition of Manrique's

Project: *César Manrique Foundation Studio, Lanzarote, Canary Islands*
Architect: *Palerm + Tabares de Nava Arquitectos—Juan Manuel Palerm, Leopoldo Tabares, partners; Sergio Garcîa Barbuzano, draftsman*
Structural engineer: *FHECOR Ingenieros—José Ramos*
General contractor: *Construcciones Bayanor*

PHOTOGRAPHY: © ROLAND HALBE





sculptures. The concrete walls are largely covered with brown basaltic stones that echo the look and feel of the area's lava, but which do not crumble under pressure. And at some striking points, the house's windows incorporate large lava formations, fused to them with silicone. These rocks appear to move seamlessly from the outside to within the structure, as if there were no separation at all, and the lava had just flowed into the studio.

Floor-to-ceiling windows in most of the living quarters, and skylights and wide openings in the central breezeway, vividly frame dense rock formations or vast expanses of landscape stretching toward infinity. The large doors and the breezeway also ensure that wind flows through the spaces. The studio's location within the earth maintains ideal temperatures, while the combination of basaltic stone and brown concrete that covers portions of the roof not only helps merge it visually with the landscape, but acts as an effective insulator, keeping the interiors cool during the day.

INSIDE, THE ARTIST "IS ALONE WITH THE LAVA AND THE SKY AND THE SEA," SAYS THE ARCHITECT.

The roof is intentionally low enough to allow occupants to walk up on it without a stairway, which would look, says Tabares, too unnatural. When you first climb on top, you see only an expanse of land and sky, but as you make your way up the incline, you eventually see the white sands and cerulean blue water of the Atlantic Ocean. Presumably, one would want to spend plenty of time perched above the building: Lanzarote only receives about 5 inches of rain a year, while cool winds across the waters keep the temperature about perfect year-round. Since stairs were needed to descend from the exterior into the studio below, the architects painted them a vivid red. "We needed them, and so decided not to pretend they weren't there," says Tabares.

The dramatic surroundings of Lanzarote presented a challenge that the architects seem to have met with a sense of balance. No building could compete with this landscape, so they felt that a stark, spare, unintrusive approach would defer most effectively to the rocky backdrop. But the building still makes its individuality known, jutting out of the earth like a torpedo, and contrasting clean, white, linear forms with the rocky landscape and the local architectural aesthetic. Inside the studio, any such theoretical thoughts, or other distractions of any kind, are washed away, and the visitor becomes engulfed in the irresistible physical drama of the view. The artist in residence here "is alone with the lava and the sky and the sea," as Tabares says. ■

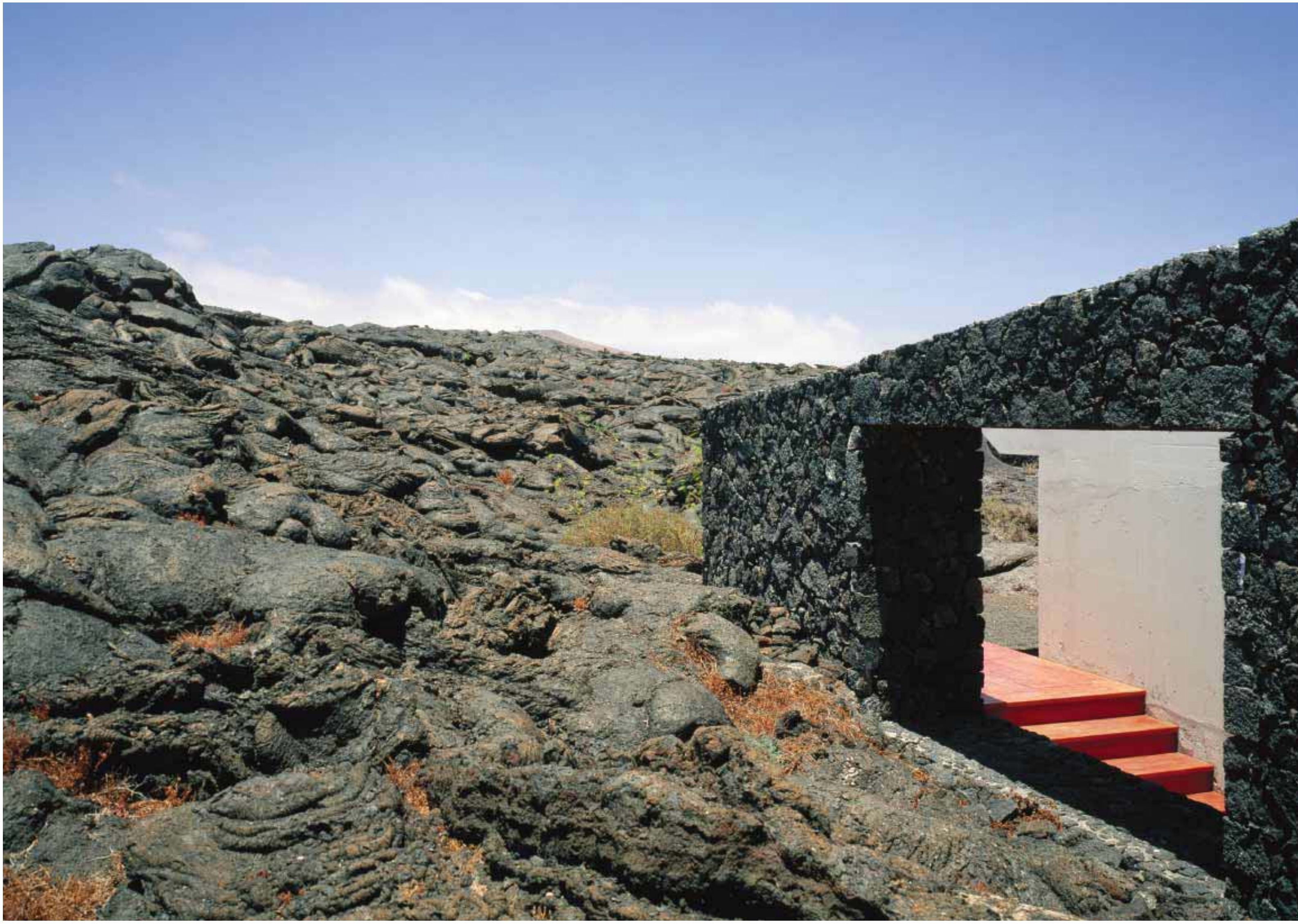
The house makes use of skylights, large openings, and expansive views of the surrounding landscape (above left). The topography is even brought inside (above right), where windows are integrated with lava formations, fused to them with silicone.

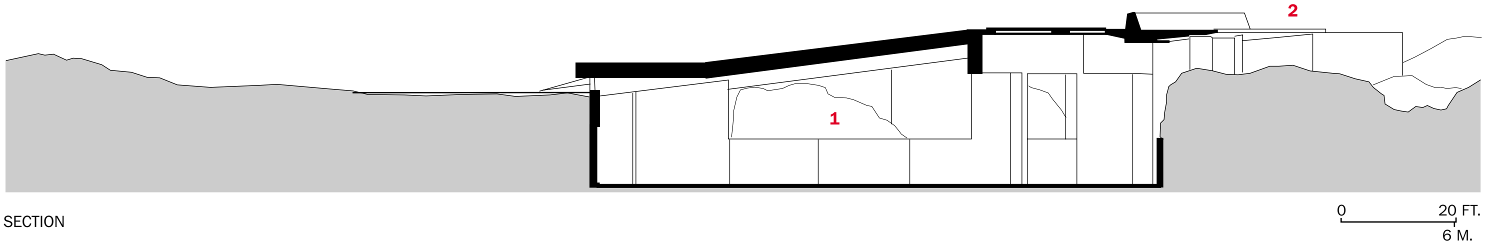
Sources

Glass: *Cristalería Insular, Lanzarote*

Lighting: *ERCO*

For more information on this project, go to Projects at www.archrecord.com.

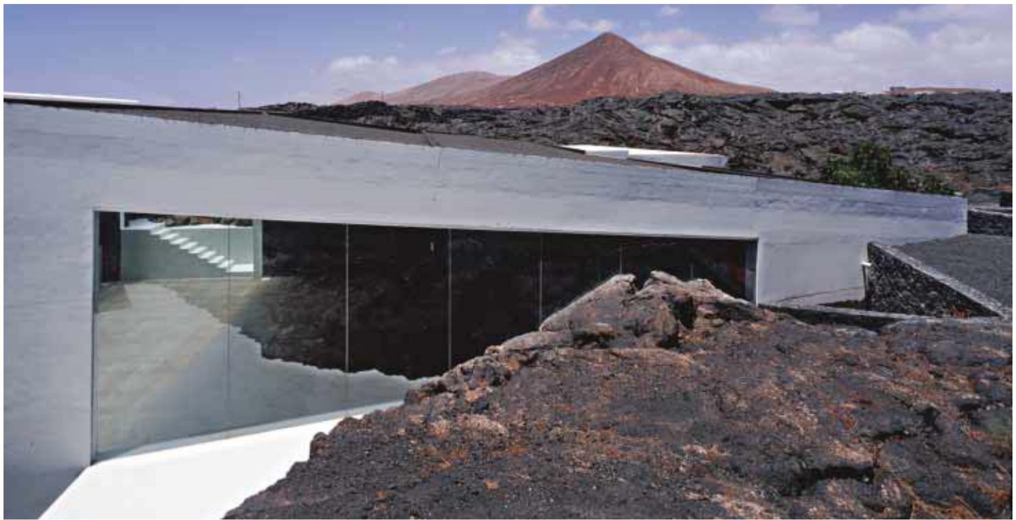


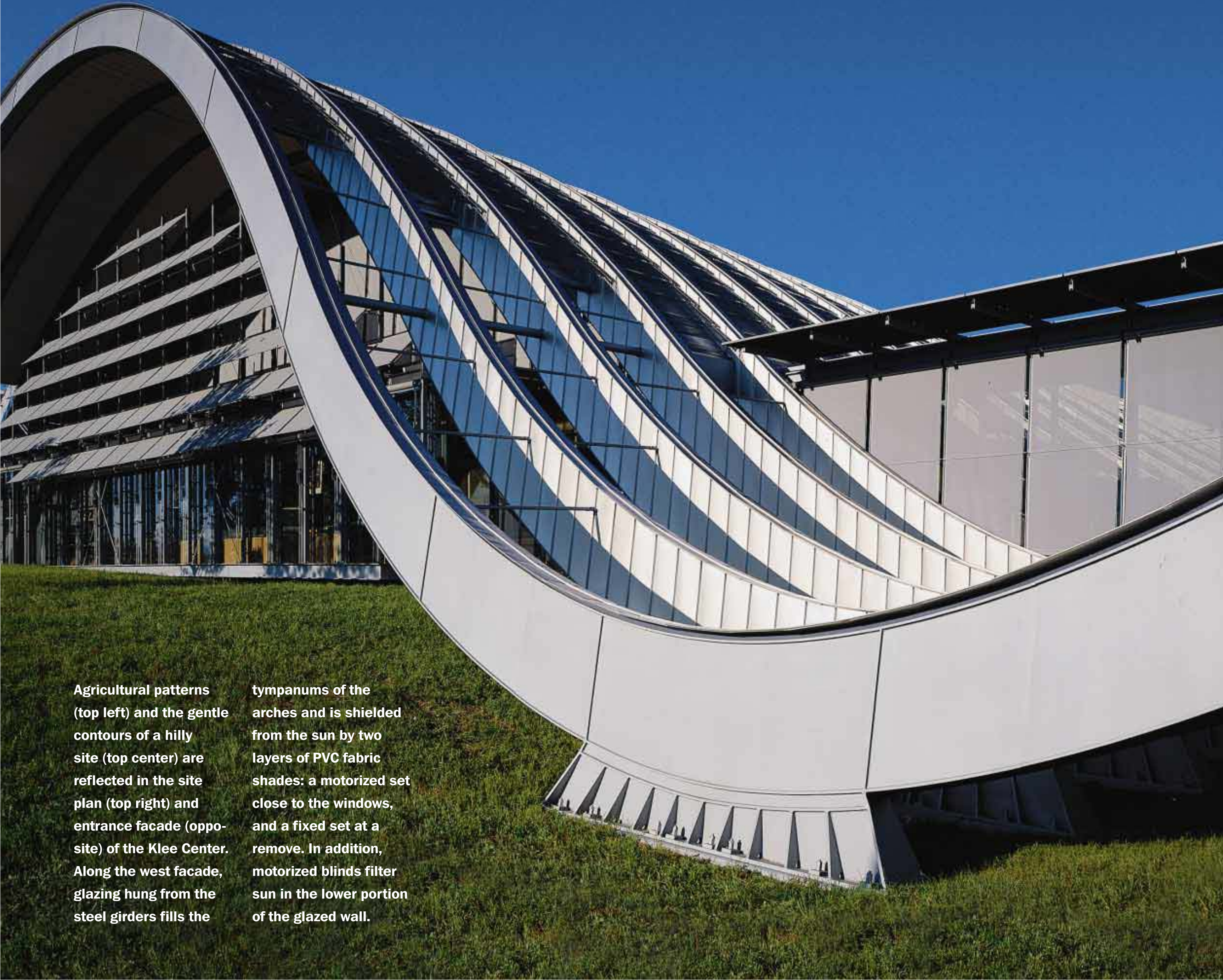


SECTION

Built into a lot originally meant for a pool, the white concrete structure (right) is enveloped by the site's petrified lava. Harder and denser basaltic stones clad studio walls. While much of the studio blends naturally into its setting, the stair, painted red (top), stands out.

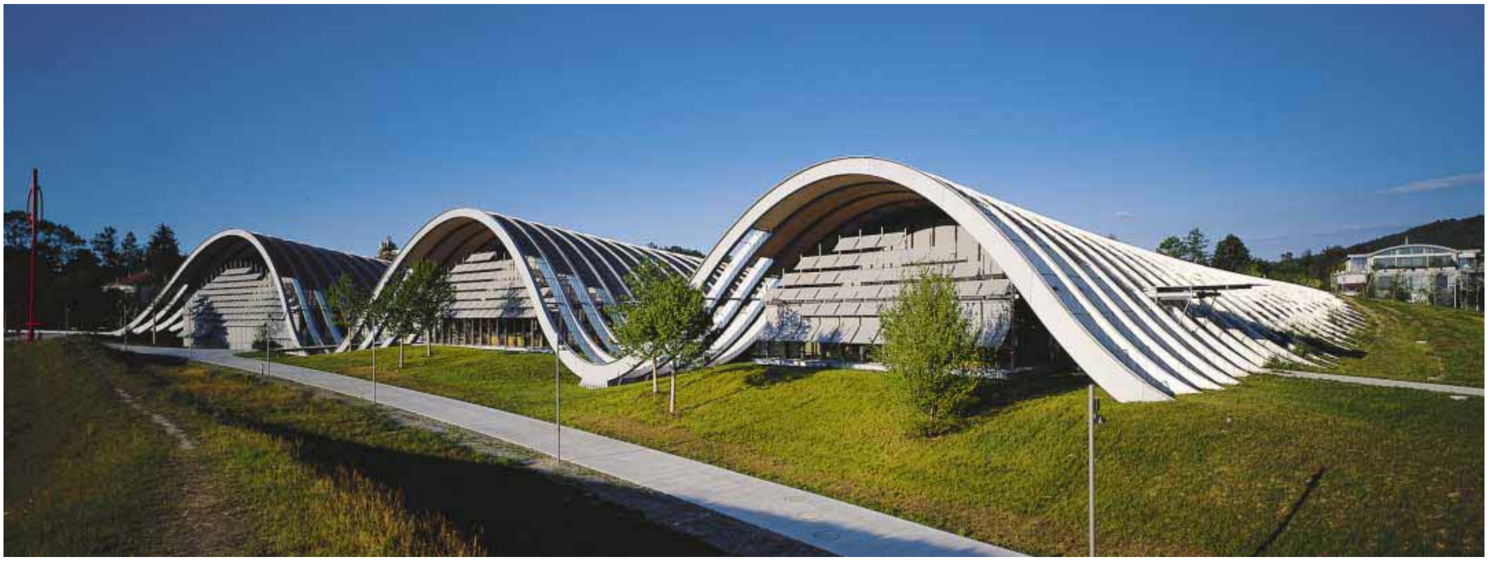
1. *Studio*
2. *Breezeway*





Agricultural patterns (top left) and the gentle contours of a hilly site (top center) are reflected in the site plan (top right) and entrance facade (opposite) of the Klee Center. Along the west facade, glazing hung from the steel girders fills the tympanums of the arches and is shielded from the sun by two layers of PVC fabric shades: a motorized set close to the windows, and a fixed set at a remove. In addition, motorized blinds filter sun in the lower portion of the glazed wall.

Renzo Piano Building Workshop teams with the earth to create an undulating setting for the PAUL KLEE CENTER in Bern, Switzerland



PHOTOGRAPHY: © CHRISTIAN RICHTERS, EXCEPT AS NOTED

By Suzanne Stephens

The bold, sinuous curves of the Paul Klee Center in Bern, Switzerland, seem surprising considering the discreet, unassertive museum design for which its architect, Renzo Piano Building Workshop, is known. Where are the rectilinear, loftlike spaces with their luminous toplighting and elegant detailing so integral to Piano's oeuvre since the Menil Collection in Houston of 1987? In this 12-acre site in the Schöngrün area east of Bern, grand, roiling, serpentine forms rising from the pastoral contours of the countryside suggest another side to Piano's architectural persona. It is a side less bent on the ethereal and more intent on engaging architecture and earth, which Piano demonstrated previously in the Tjibaou Cultural Center in Noumea, New Caledonia, and currently in a project for the California Academy of the Sciences in San Francisco (see page 98).

Yet, as compelling as this muscular architecture-as-earthwork is, visitors familiar with the small-scale, delicate art of Paul Klee may be disappointed to see the painting, drawings, and watercolors of the lyrical 20th-century Modern master installed in two large galleries that omit natural light altogether.

Piano's turning away from toplighting and toward the topographical at the Klee Center reflects the set of complex circumstances that brought the 160,000-square-foot museum into being. The formation of the $86 million center, created by a public and private partnership, began with a commitment by Klee's heirs to displaying the work of the artist, born in 1879, who spent much of his childhood and the last years of his life in Bern, where he died in 1940. In 1997, his daughter-in-law Livia Klee-Meyer proposed donating 638 of Klee's artworks to the canton (state), the city, and a special governmental body, the Civic Community of Bern, if they would build the center by 2006. In addition, Klee's grandson, Alexander Klee, promised a permanent loan of 650 works; this, added to a city-owned collection, would form a total of 4,000 items, the bulk of them drawings.

Initially, the museum was slated for the center of Bern. Then in 1998, Dr. Maurice E. Müller, an orthopedic surgeon who developed the artificial hip, and his wife Martha Müller-Lüthi offered $47 million for its construction, along with land in suburban Schöngrün near Klee's burial place. The Müllers also wanted Piano as the architect, since he had come highly recommended by the pianist Maurizio Pollini, a former patient of Dr. Müller. Ultimately, the city added more land and donated lottery money for museum furniture and finishes, while a private group of sponsors came up with more funds for the project.

The museum's program called for a main hall 18,837 square feet in size, and a 9,150-square-foot gallery for temporary exhibitions, as well as studios for art education—adult and children. Also included was a 300-seat auditorium for concerts (Klee was also a musician), along with the usual complement of storage space, conservation areas, and offices. In designing the center, Piano, and senior partner in charge Bernard Plattner, worked with the Bernese architectural practice ARB Architects, headed by Kurt

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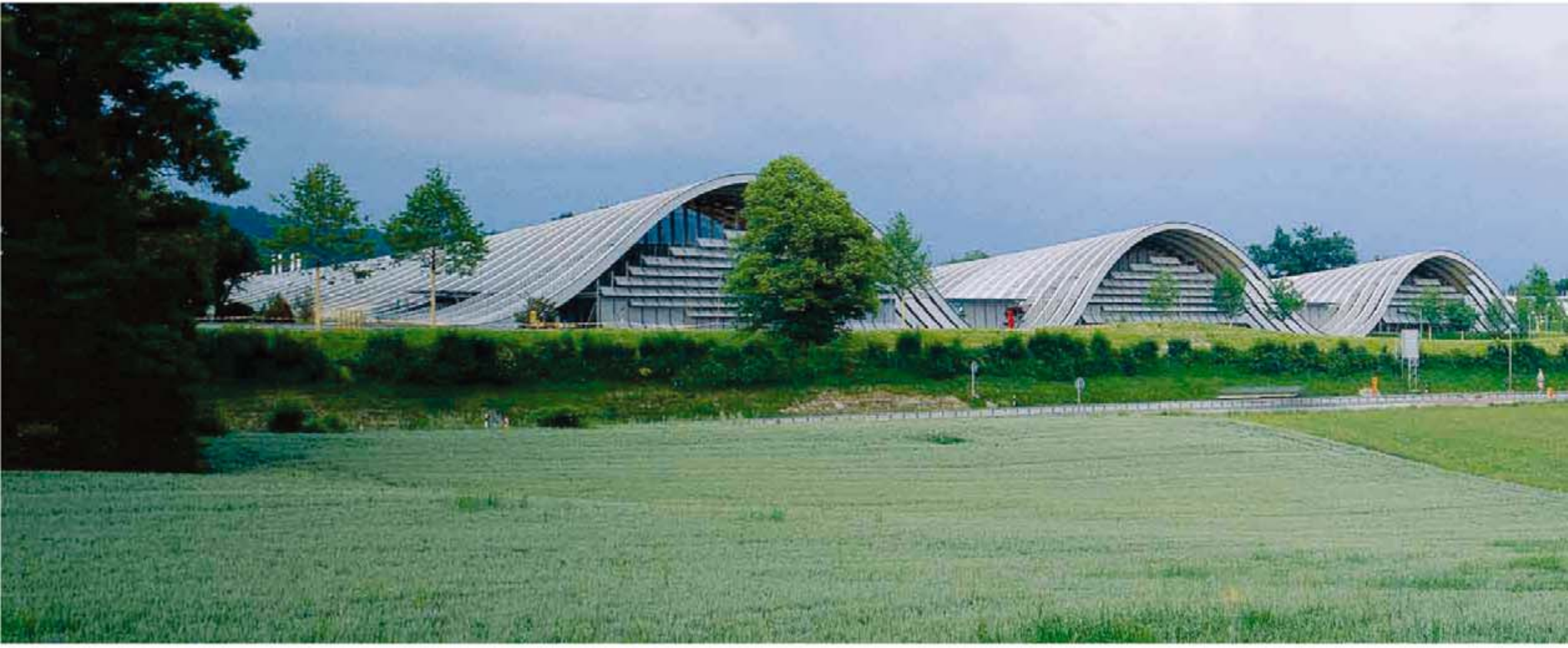
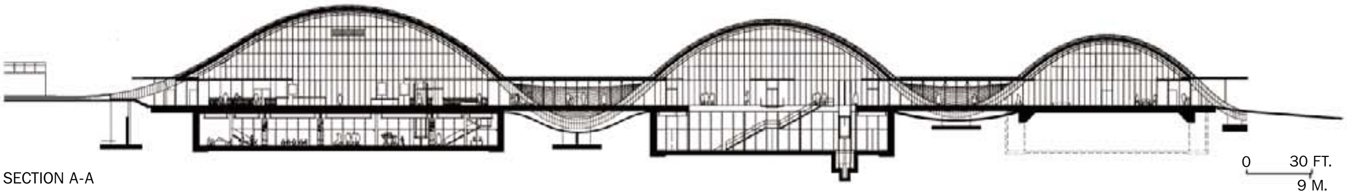
Project: *Paul Klee Center, Bern, Switzerland*

Architect: *Renzo Piano Building Workshop—Renzo Piano, principal; Bernard Plattner, senior partner in charge*

Associated architect: *ARB Architects—Kurt Aellen, principal*

Engineers: *Arup, London (Bob Lang, structural; Andrew Sedgewick, m/e/p)*





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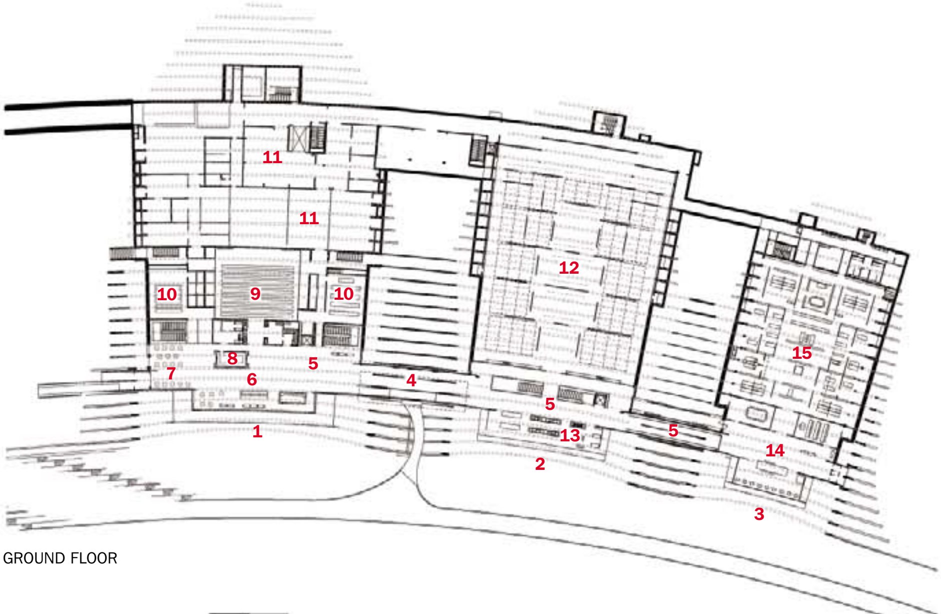
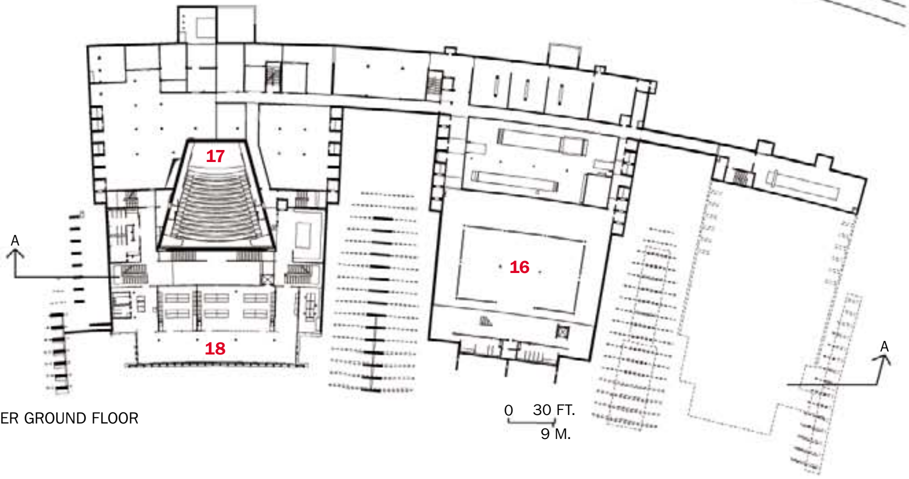


GROUND FLOOR



LOWER GROUND FLOOR

Although the center seems to spring up out of the ground along the west facade (top spread), at the rear, the glass and steel hills gradually are taken over by grass and plants sprouting up between the ridges and their stepped-metal louvers (opposite, bottom).

1. *North pavilion*
2. *Central pavilion*
3. *South pavilion*
4. *Main entrance*
5. *Concourse*
6. *Information*
7. *Café*
8. *Serving station*
9. *Screening room*
10. *AV rooms*
11. *Conservation labs*
12. *Permanent collection*
13. *Shop*
14. *Reference section*
15. *Offices*
16. *Temporary galleries*
17. *Auditorium*
18. *Art workshops*

Aellen, and the London office of Arup to come up with a scheme that divided the museum into three hill-like forms. A 492-foot-long glazed concourse along the entrance facade connects the " hills," a series of parabolic arches formed from bent steel profiles that gradually merge into the grassy knoll at the rear of the complex. At the front, where the three pavilions spring energetically from the ground, glass walls and metal louvers partially fill in open spaces between the girders.

Melding a building into this hilly site required a fair amount of earth moving, especially in the north pavilion, where lower-level art studios receive daylight through glazing along the west wall. To anchor the steel arches to the earth, the architects and engineers tied them both to the poured-in-place-concrete retaining and foundation walls, topped by a concrete deck, and also to a cable system that keeps the foundations from moving. Since the three hill-like structures assume different curves, the arches shift in radius from one to another and from pavilion to pavilion. The irregularity of the radii meant that a number of the box-section girders had to be hand welded, although a large portion could be fashioned by machine.

The skylights that top the administrative offices in the south pavilion afford a luxury not allowed to the middle pavilion, where Klee's art is exhibited, or the north pavilion's conservation spaces. "It is sad there is no natural light in the Klee galleries," says Piano, "but only 4 or 5 footcandles of light could be permitted there." The curator of the collection, Michael Baumgartner, attests that Klee's oils, watercolors, and drawings are extremely fragile: Even when he used oil, Klee often worked on burlap or newspaper more than canvas, and frequently mixed oils with watercolors.

In the main gallery, Piano placed the small-scale works on white partitions suspended by cables from the curved beams, so they float just above the floor. He then hung horizontal panels of translucent fabric above the partitions: With a gallery that rises to 35 feet at its highest point, the ceilinglike scrims create a more intimately scaled space for the exhibited works. The panels also diffuse the illumination from metal-halide light fixtures that project up to the ceiling, as well as halogen lights closer to the artworks.

The eerily luminous effect does help mitigate that airplane-hangar feeling in this space. Downstairs, however, in the temporary gallery, the lack of daylight is very noticeable: The flat ceiling, 16 feet high, and the thick, 16-inch-deep partitions that stop 3 feet short of the ceiling, is dreary. While Baumgartner defends this space as being able to accommodate a variety of art usually characteristic of temporary shows, including video, the gallery still has that locked-in, basement feeling. The auditorium, however, in the lower level of the north pavilion, avoids this problem, due to bright red acoustical baffles and seats. But, then again, the program and expectations are quite different.

As a whole, the center fits into its hilly context extraordinarily well; when more trees are planted along the front, and when more vegetation overtakes the roof at the back, the integration with nature no doubt will be impressive. Although the emphasis on the serpentine line recalls many of Klee's own motifs, the detailing of the gigantic girders obviously lacks the delicacy of the art. Nevertheless, the community has adopted the center as a gathering spot; it helps that a free city bus line takes visitors directly to it. In addition, Piano renovated and expanded a villa next door for a haute-cuisine restaurant (a distinct plus, considering the mediocre fare of the center's own café).

As a contribution to the evolution of gallery design, however, the center still leaves you wishing for a different kind of setting for Klee's works. Piano and his team faced a major challenge in designing a low-lit, intimate gallery space for a pastoral site. But while they came up with an arresting solution, the topographical experience still overwhelms the museological one. ■

PHOTOGRAPHY: © MICHEL DENANCE (THIS PAGE, BOTTOM, AND OPPOSITE, BOTTOM)

Sources

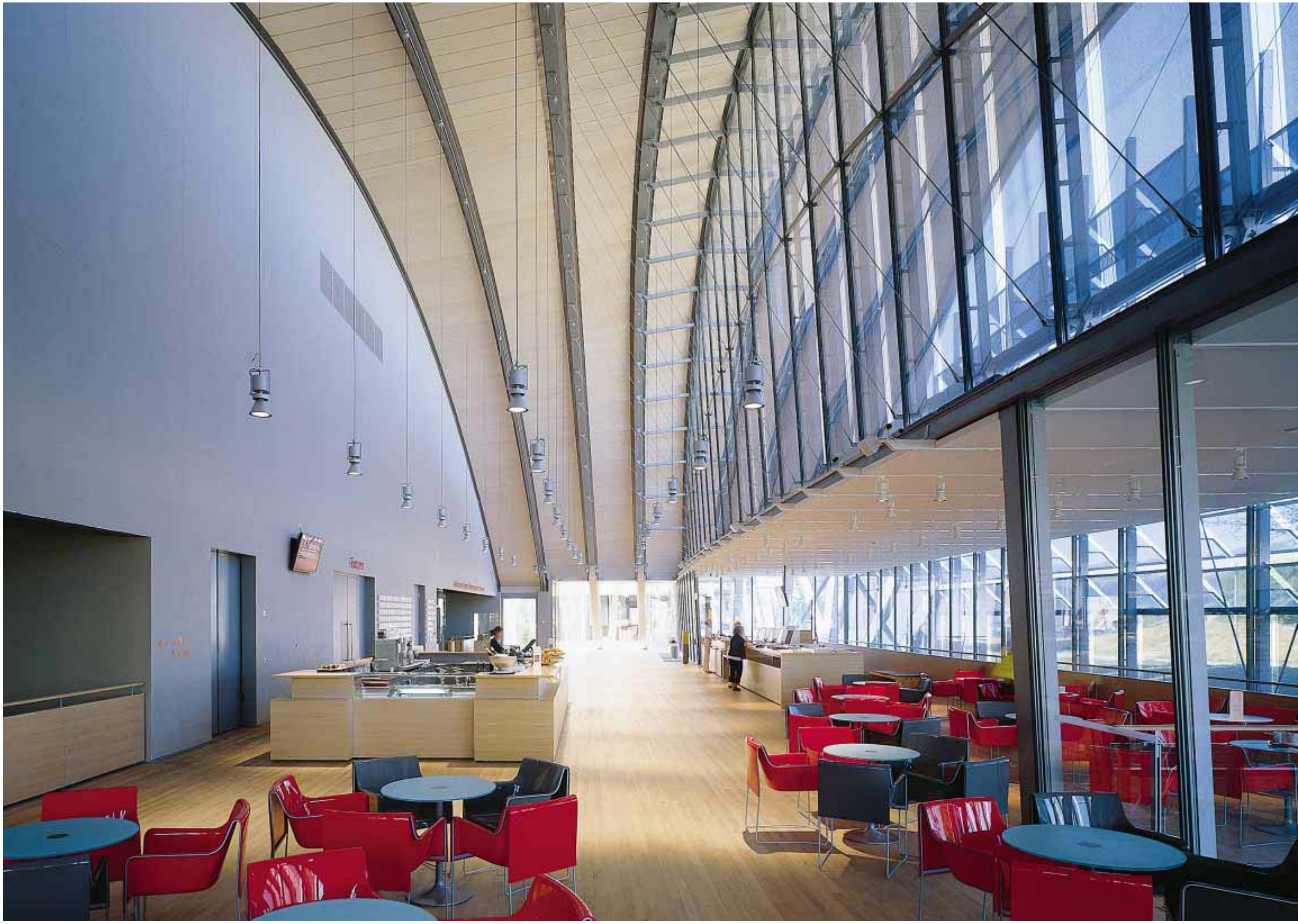
Steel girders: *Zwahlen & Mayr*

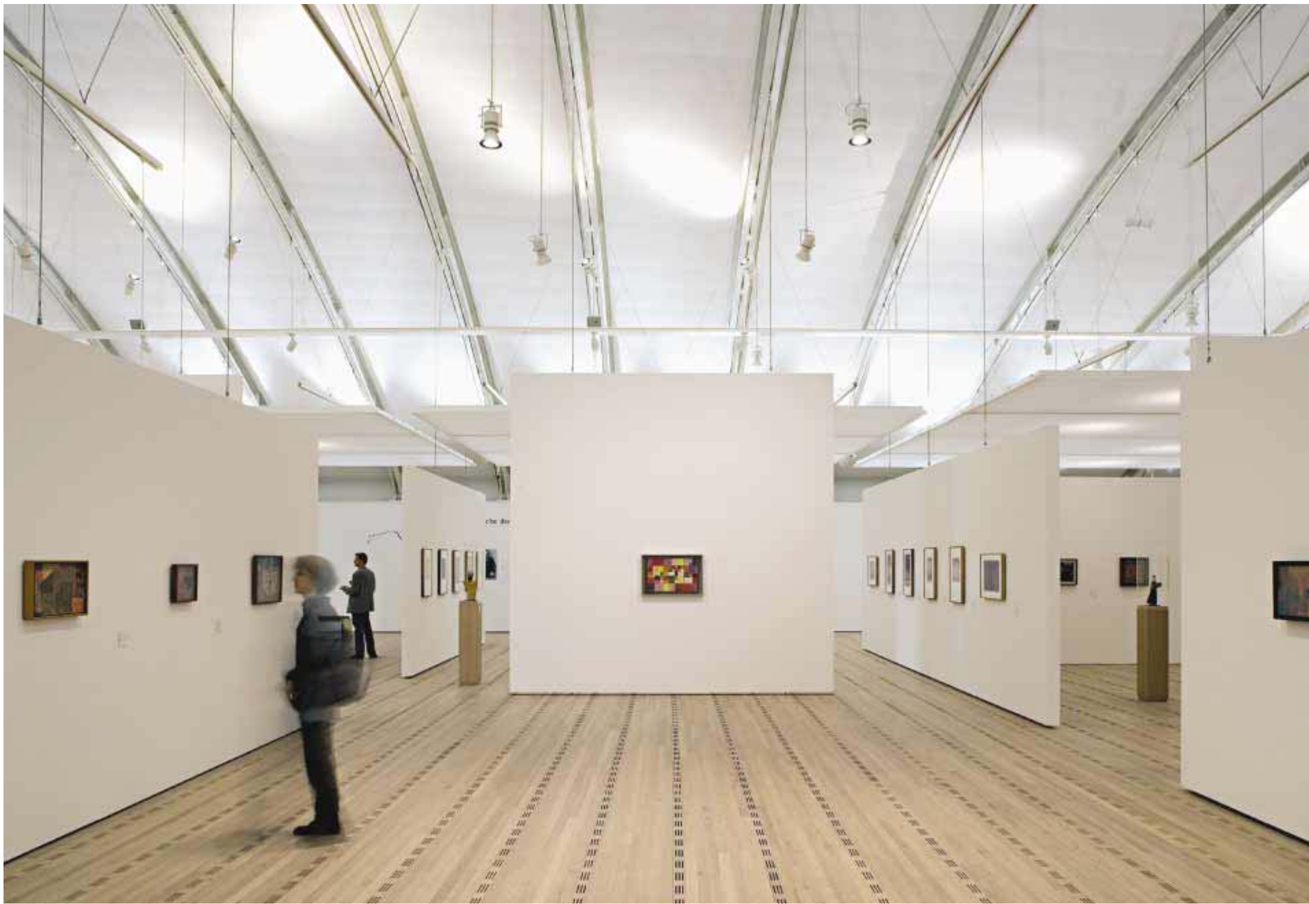
Stainless-steel roofing: *Uginox*

PVC-coated fabric shades: *Ferrari*

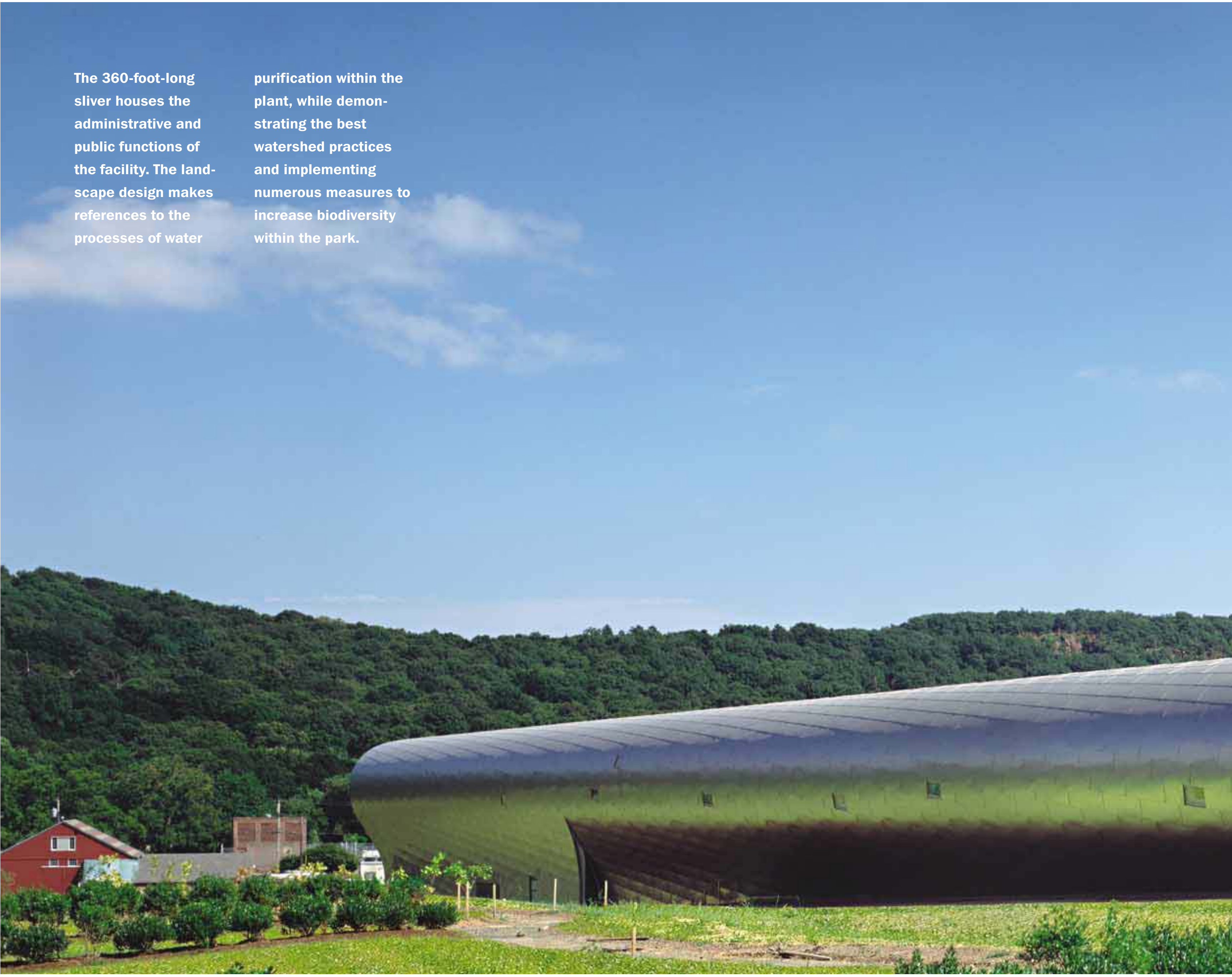
Lighting fixtures: *iGuzzini; Erco*

For more information on this project, go to Projects at **www.archrecord.com**.



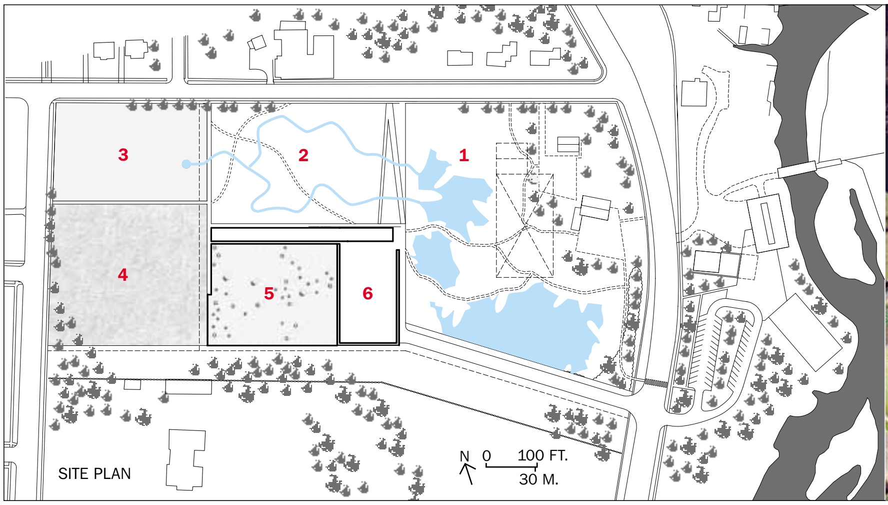


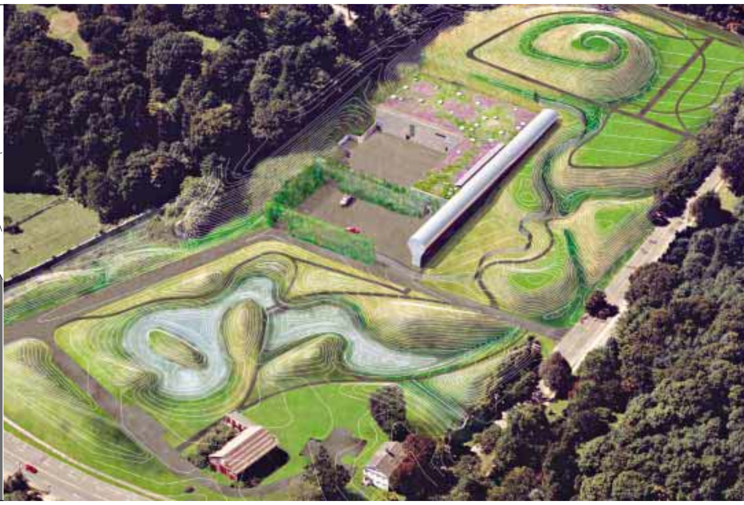
A bridgelike entrance path winds across the dips between the curving steel ridges (opposite, top), which in turn are braced by compression struts (opposite, bottom). A 492-foot-long concourse with a café and bookstore runs along the west entrance facade linking the three pavilions (above). Oak sheathes floors, open-riser stairs, and the ceiling of the hall. In the main exhibition space in the middle pavilion, acoustical paneling lines the ceiling. Low horizontal scrims diffuse metal-halide and halogen lighting, and create a ceiling plane (right) for the small-scale art.



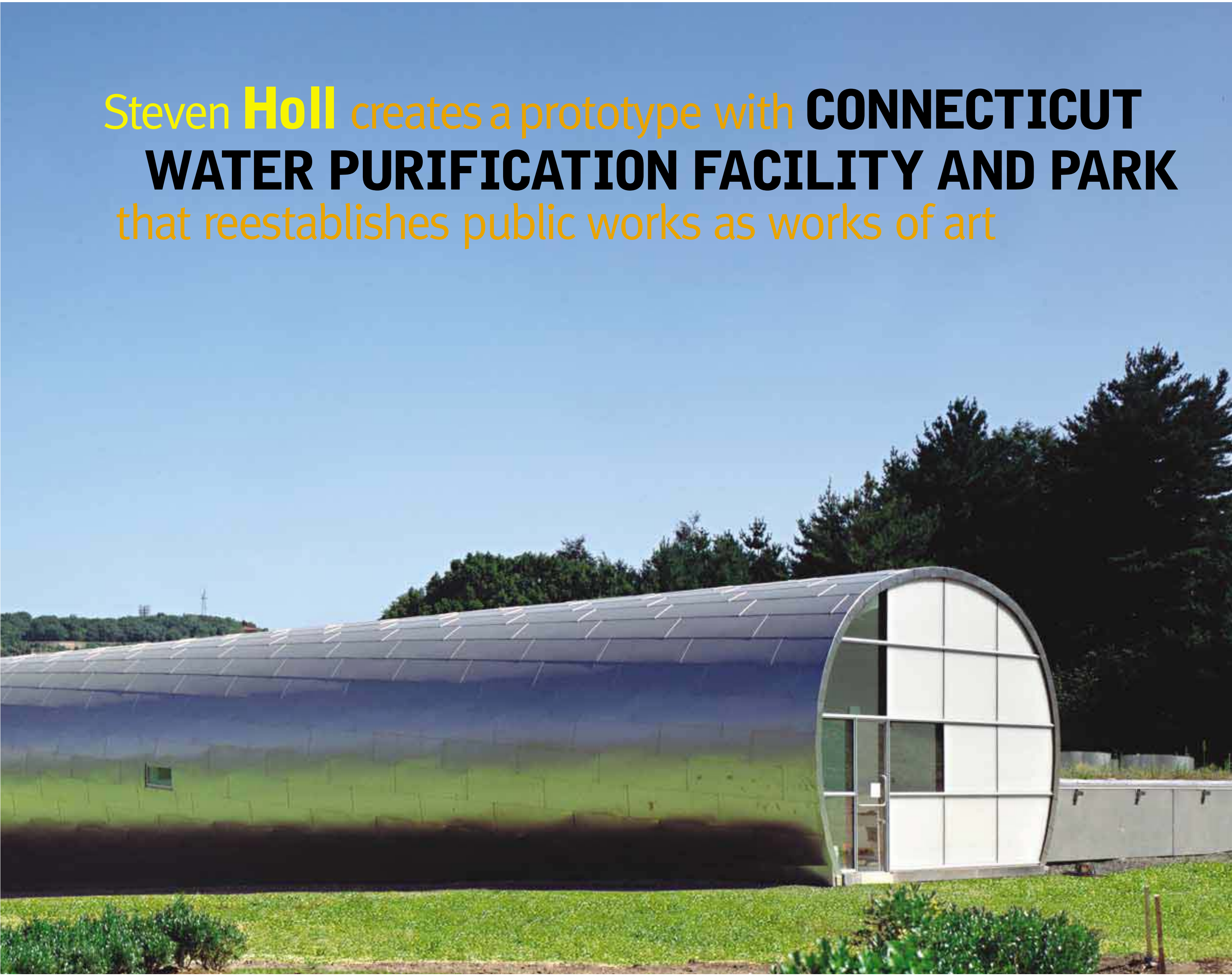
The 360-foot-long sliver houses the administrative and public functions of the facility. The landscape design makes references to the processes of water purification within the plant, while demonstrating the best watershed practices and implementing numerous measures to increase biodiversity within the park.

1. *Wetlands*
2. *Turbulent lawn*
3. *Chlorophyll garden*
4. *Wave meadow*
5. *Bubbling marsh*
6. *Filter court*





Steven **Holl** creates a prototype with CONNECTICUT WATER PURIFICATION FACILITY AND PARK that reestablishes public works as works of art



PHOTOGRAPHY: © PAUL WARCHOL

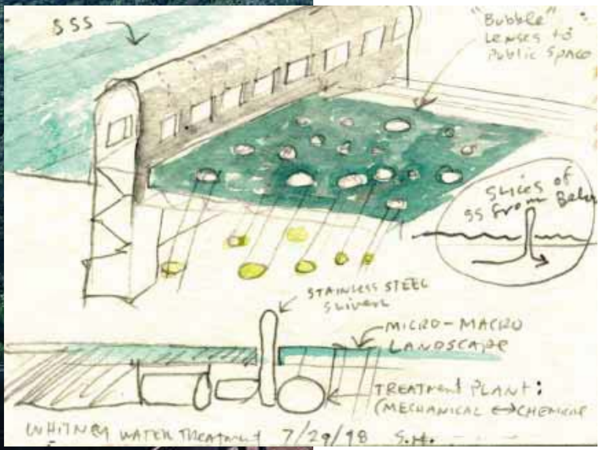
By Sara Hart

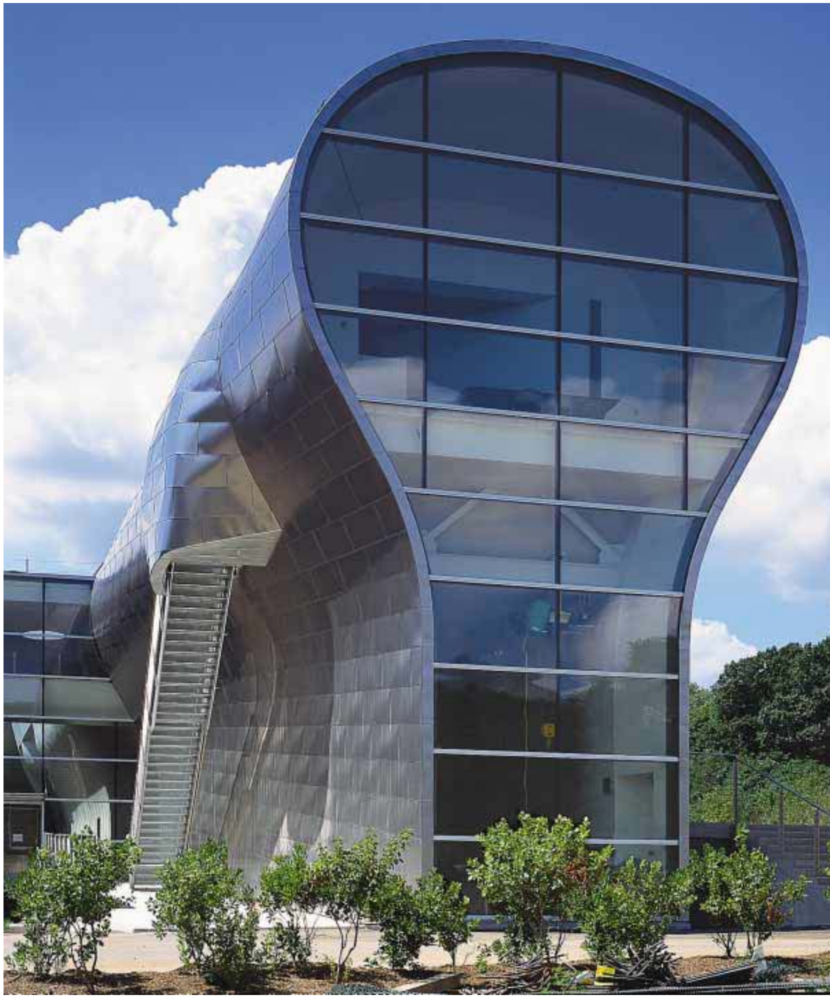
Passing motorists and unaware locals often assume that this elegant structure pressed into a gently sloping site is some sort of cultural institution. It could be. Set back from a busy road, it reads as a long, silver ingot, stretching 360 feet into infinity. The fact that no sign identifies the building makes it all the more conspicuous, presumably not what the client intended.

The reality is more down-to-earth. The building actually houses a hard-working water-treatment plant, which produces 15 million gallons of clean water every day for south-central Connecticut. Then why does an industrial container for heavy machinery require the design talents of the renowned architect Steven Holl? The answer, in this case, is location. The neglected site had been occupied by the ruins of an abandoned, century-old water-treatment plant. Its upper-middle-class neighbors, already displeased with the existing eyesore, were not going to welcome a concrete bunker as the replacement centerpiece for their idyllic environs. The client, the Regional Water Authority, anticipated opposition and enlisted the community to advise it in the selection of an architect. After interviewing several firms, the authority and the committee agreed to award the commission to Holl's New York–based firm.

The challenge of developing an architectural vocabulary to give form to a highly specialized program inspired Holl and his team, led by partner Chris McVoy, to immerse themselves in the complex science of water purification—a series of stages that begins at the molecular level. Their

Project: *Connecticut Water Purification Facility and Public Park*
Owner: *Regional Water Authority*
Architect: *Steven Holl Architects—Steven Holl, Chris McVoy, design architects; Anderson Lee, Arnault Biou, Annette Goderbauer, Urs Vogt, design architects; Justin Korhammer, Linda Lee, Rong-hui Lin, Susi Sanchez, project team*
Engineers: *CH2M HILL; Tighe & Bond Consulting Engineers; The Bioengineering Group*
Landscape architect: *Michael Van Valkenburgh & Associates*


SSS
"Bubble" lenses to public space
Slices of SS from Bel
STAINLESS STEEL SLIVER
MICRO-MACRO LANDSCAPE
TREATMENT PLANT: (MECHANICAL ↔ CHEMICAL
WHITNEY WATER TREATMENT 7/29/98 S.H.

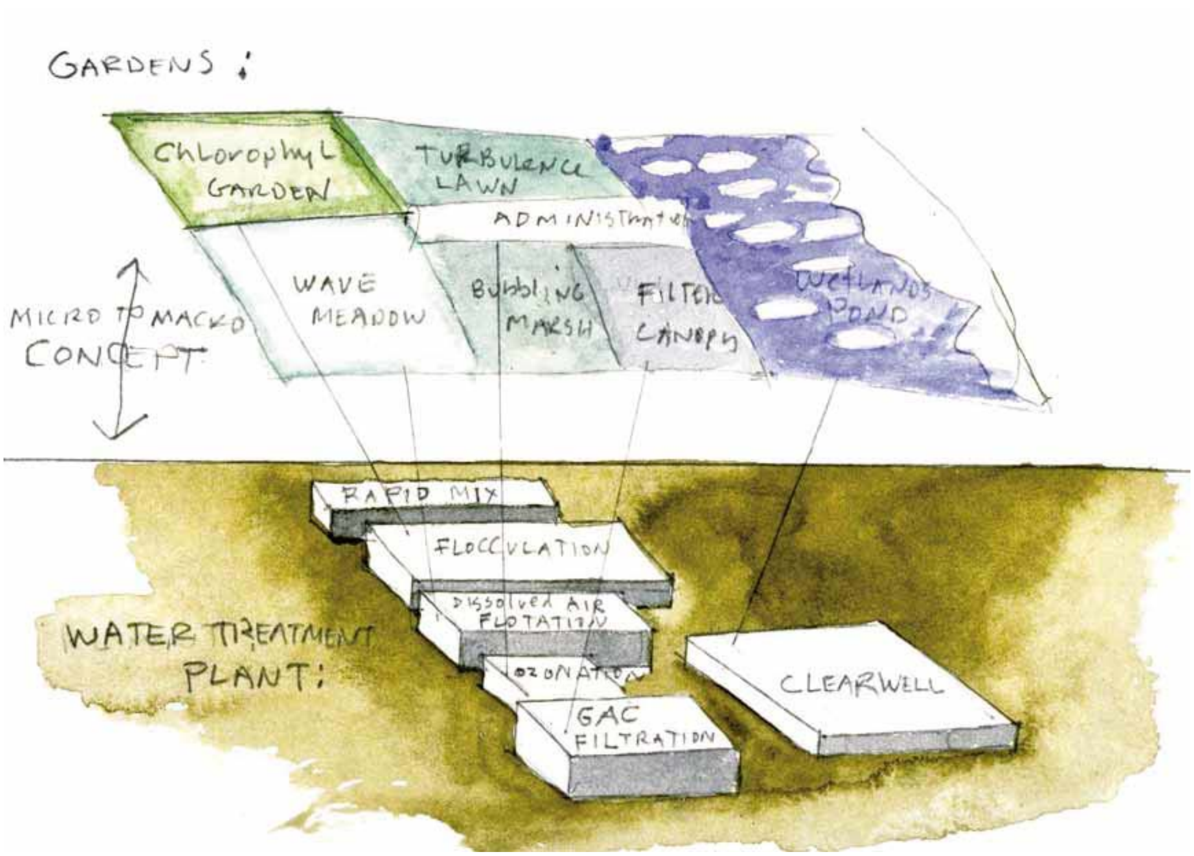


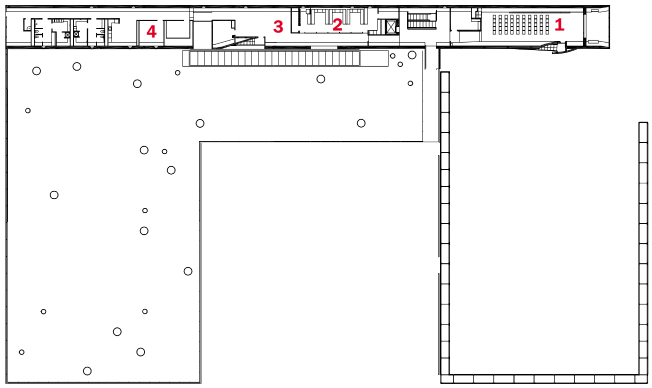
A trellis, which will eventually be covered in vines, encloses the entrance court (opposite). The irregular contour of the pond promotes interaction between soil, water, and plants, which encourages beneficial biogeochemical reactions. The glazed end of the sliver (above right) reveals a multipurpose space on the upper level for educational seminars. The finish water pumps are visible at the ground level.

investigation led to the creation of a two-story, shimmering sliver, which houses the public and operational programs, while the water-treatment facilities are dispersed on several levels below grade. Whereas the sliver resembles an inverted drop of water, Holl avoided creating what he calls "an expressionistic artifice" by allowing certain functions to interrupt the form. Gentle bulges appear along the sliver. These are not imperfections, but rather opportunities to insert openings or exterior stairs obliquely against the form.

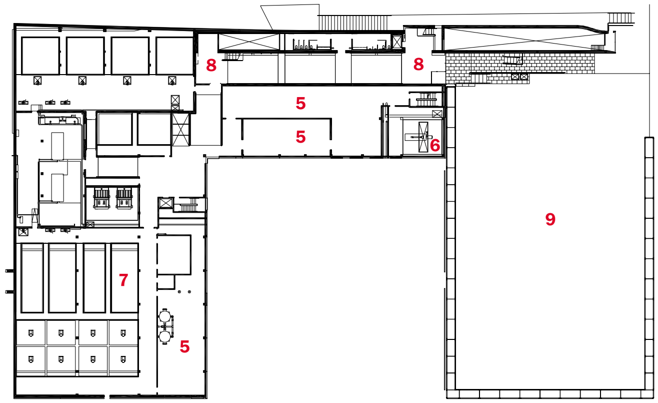
The sliver is a rather simple and economical structure, constructed out of prefabricated steel hoops, enclosed with metal decking, then clad with flat-lock, stainless-steel panels or shingles. Holl then made another architectural move. He turned the level shingle pattern downward at a 6-degree tilt from the curve in section. Not only does this animate an otherwise static surface, it has structural significance as well. The thin shingles warp in two directions against the curve, which stiffens them and thus minimizes oil canning (denting).

Holl's water-treatment plant could exist quite comfortably in a passively groomed meadow, but the program called for it to be integrated into a public park. Holl conceived of the 14-acre park as a metaphor for the six stages of purification, by rendering them in six uniquely landscaped sectors around the building. Michael Van Valkenburgh and Associates, the landscape architect charged with interpreting this vision, collaborated with The Bioengineering Group (TBG) to adopt those watershed-management practices that maintain natural hydrology. He adopted a low-impact site design, and created a 30,000-square-foot green roof with glazed "bubbles" that flood the facilities below with daylight. His firm designed gardens to filter and store storm water, thus preventing run-off to neighboring sites. TBG created a pond of varying depths and edge conditions and introduced a diverse selection of native plants to


GARDENS:
CHLOROPHYL GARDEN
TURBULENCE LAWN
ADMINISTRATION
WAVE MEADOW
BUBBLING MARSH
FILTER CANOPY
WETLANDS POND
MICRO TO MACRO CONCEPT
WATER TREATMENT PLANT:
RAPID MIX
FLOCCULATION
DISSOLVED AIR FLOTATION
OZONATION
GAC FILTRATION
CLEARWELL



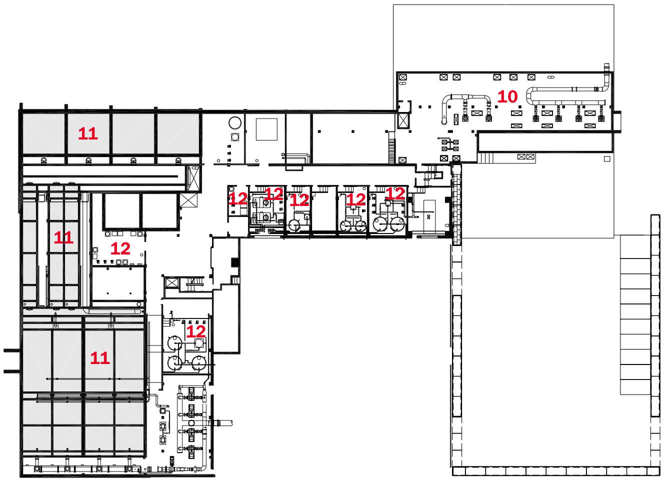
FLOOR PLAN LEVEL +43'-0"



FLOOR PLAN LEVEL +32'-0"

Holl's conceptual, watercolor sketch (top) illustrates his strategy to bond the water-treatment functions to the functions of a working landscape. His drawing outlines the story of the "micro to macro" purification process, which he imagined rendered in six distinct sectors around the plant.

1. *Auditorium*
2. *Laboratory*
3. *Control room*
4. *Administration*
5. *Mechanical/electrical*
6. *Residuals*
7. *Water storage*
8. *Lobby/exhibition space*
9. *Filter court*
10. *Pump room*
11. *Process area*
12. *Chemical storage*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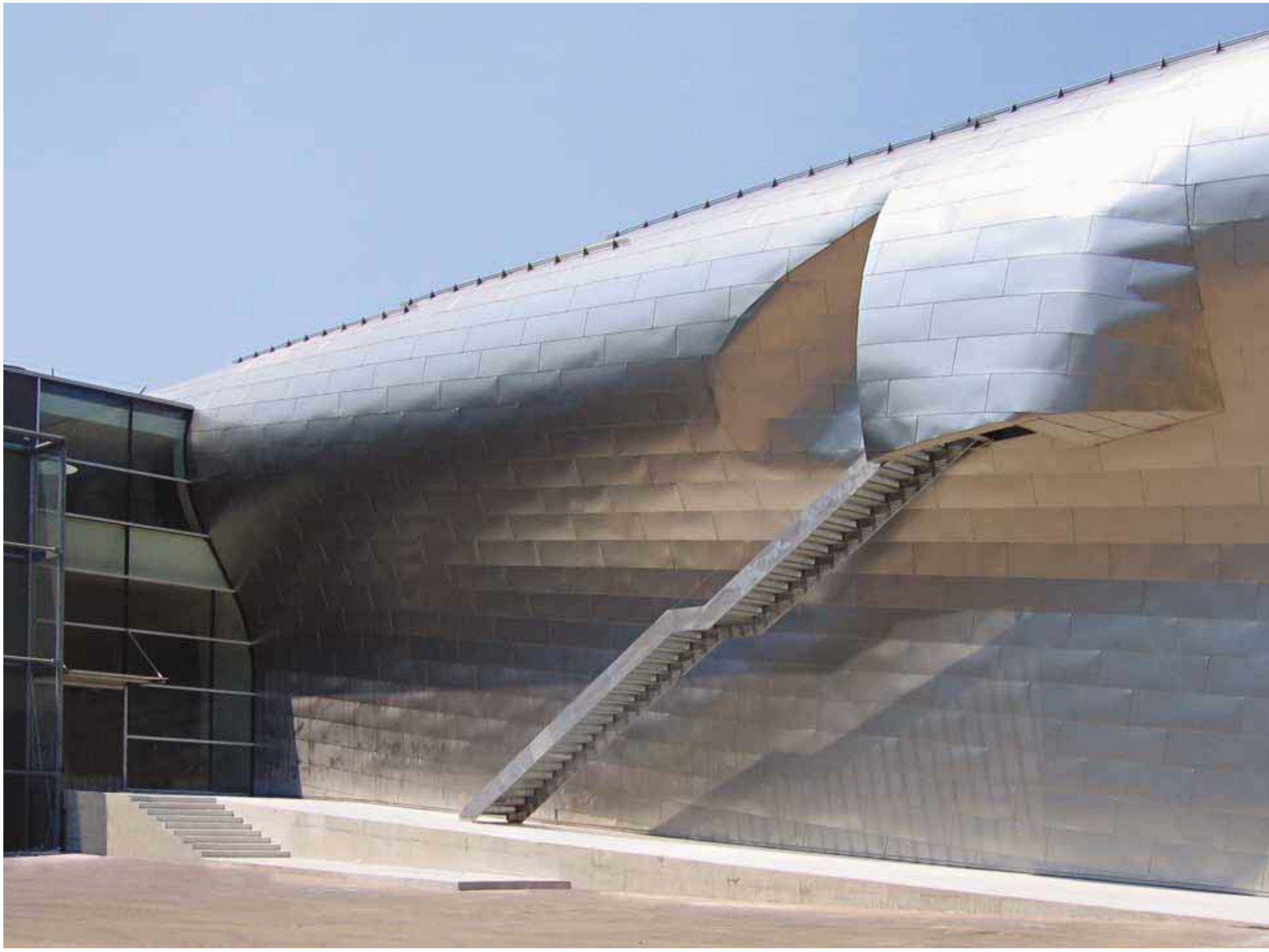
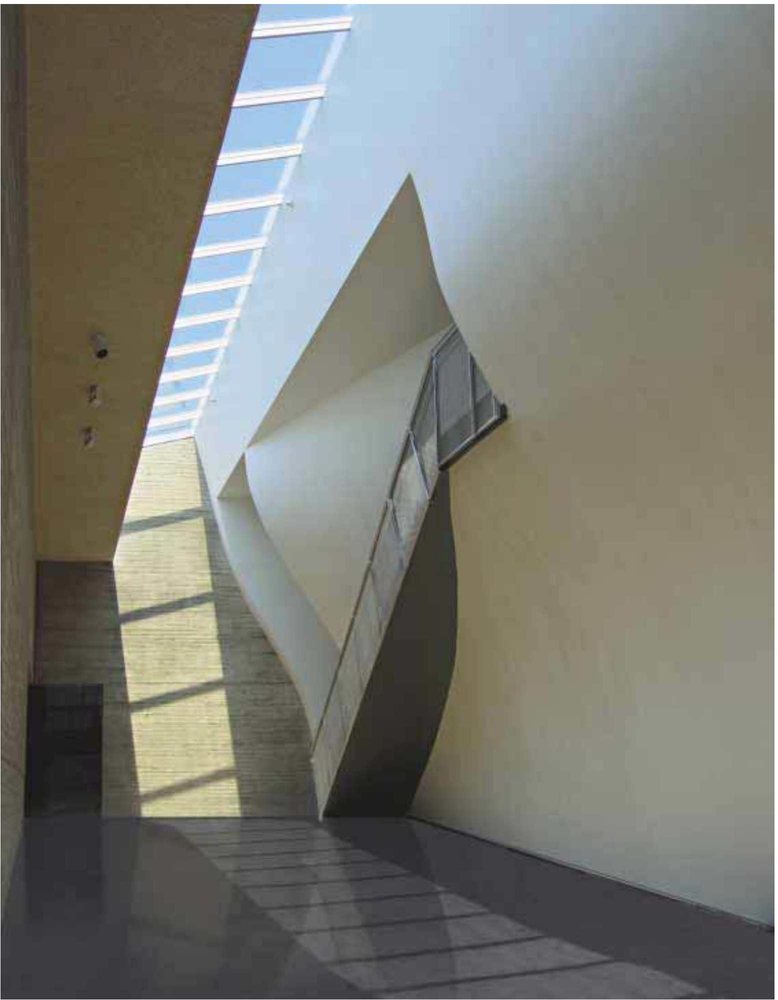
FLOOR PLAN LEVEL +18'-0"

N 0 30 FT.
9 M.

The glazed entrance to the facility (right) leads into the main lobby (below), a space so serene and beautifully crafted that visitors might expect to find a cultural enterprise behind the walls rather than an industrial one. The external stair leads to a multipurpose room, designed for educational seminars and other activities.





create conditions necessary for biogeochemical reactions.

It's hard to recall a recent U.S. project in which architecture and landscape are more intimately bonded. The bond establishes a link between the mechanical processes that artificially renew life-sustaining resources, such as water, and the natural processes sustaining their vitality. This relationship evolved from a conscious effort on the part of the client, the architect, and the environmental consultants to give the project a higher purpose—to educate the public about urgent environmental issues, such as maintaining an abundant supply of clean water, protecting riparian resources, and encouraging sustainable wetlands stewardship. At the moment, the higher educational purpose has been seriously undermined. Citing security issues, the current administration has reneged on its commitment to open the plant to the public, in spite of Holl's studious efforts to create a learning center. His interiors would provide a logical procession through the building so student groups could witness the complex processes involved in water purification. He introduced a multipurpose room that converts easily to an auditorium with a state-of-the-art audiovisual system for teaching purposes.

Whether or not this decision is reversed, Holl's design, coupled with Van Valkenburgh's landscaping artistry, should establish both precedent and prototype for ushering in a new and long-overdue era of architecturally distinguished public works. ■

Sources

Metal/glass curtain wall: *A. Zahner*

Stainless-steel cladding: *A. Zahner*

Green roof: *Roofscapes*

Precast concrete: *Coreslab*

For more information on this project, go to Projects at **www.archrecord.com**.

AIRPORTS

Heavy Weather

AS AIRLINE WOES AGAIN DRIVE ROCK-BOTTOM AMERICAN AIRPORT DESIGNS, INTERNATIONAL HUBS MAKE PASSENGER AMENITY A PRIORITY. CAN WE AFFORD TO MAKE OLD MISTAKES AGAIN?

By James S. Russell, AIA

In September, Northwest and Delta slid into bankruptcy. Now four of the seven major carriers keep flying only with legal protection from creditors. The terror attacks of September 2001 exposed vulnerabilities in an already-troubled airline industry that $15 billion in bailout cash from the federal government has failed to reverse even as travel has bounced back. With declining quality of accommodation, fewer flights, long lines, and other security hassles, passengers are unwilling to pay more than rock-bottom prices, so losses still flow at major airlines. The plunge in travel after 9/11 also deprived airline operators of the cash they needed for capital projects, except for security expenditures, underwritten by $11 billion in federal cash.

This difficult economy has made itself felt in U.S. airline facilities—and not for the better. An addition to Seattle-Tacoma, though becomingly modest, has been compromised for now by still-evolving standards for security. Terminal D, in Dallas/Fort Worth, aspired to transcend the severe constraints imposed by a 30-year-old master plan. Though bright and airy, it suffers from a budget-driven timidity that may haunt it in years to come. Ben Gurion, by contrast, counterpoints extraordinarily demanding screening procedures with a focus on travelers' well-being and unique connection to Israel as a cultural if not literal "home" for Jews. Richard Rogers and Lamela Studio made passage through titanic Barajas welcoming, even exciting, and as clear as possible.

With U.S. passenger numbers reaching record levels, airports must build in this confounding time. The Airports Council International has counted up $71.5 billion of current projects. They assume a level of spending through 2009 that is as much as one third more than in the 2002 to 2006 period. How much money is actually spent depends on Congress, however, which will have an extraordinarily difficult time coming up with its share of the cash.

Shrinking spending while accommodating more elaborate security requirements is the new norm. American Airlines just opened a budget-slashed $1 billion terminal at JFK that has all the charm of a high-school gymnasium. Jet Blue has asked Gensler (with the Rockwell Group) to wrap Eero Saarinen's JFK TWA Terminal with 26 new gates for $125 million less. Gensler (with Hamilton Anderson Associates and Ghafari Associates) also is trying to bring in a 26-gate terminal replacement at Detroit Metro for a bargain-basement $443 million. It's not the first time airline woes have whipsawed terminal investments. The nation is littered with the miserable, dysfunctional results. (Houston's George Bush and JFK's Delta top my must-avoid list.) Are we doomed to make old mistakes again?

1.

Madrid, Spain

For 38 gates in two structures, Richard Rogers Partnership and Lamela choreograph the movement of passengers under a sensuously undulating roof.

2.

Tel Aviv, Israel

Moshe Safdie and Skidmore, Owings & Merrill have created a travelers' oasis in one of the world's most heavily secured airports.

3.

Dallas/Fort Worth, Texas

For DFW's fifth terminal, HNTB, HKS, and Corgan reinvent a 1974 prototype as a massive hub for transferring international travelers.

4.

Seattle, Washington

In an airy addition, NBBJ coped with fast-changing security requirements on the fly while staying true to a successful terminal prototype.

For more information on these projects, go to Building Types Study at *www.archrecord.com*.

PHOTOGRAPHY: © AMPARO GARRIDO (1); ALAN KARCHMER/ESTO (2); BRAD FEINKNOPF (3); CHRISTIAN RICHTERS (4)

Madrid Barajas Airport
Madrid, Spain

1

RICHARD ROGERS PARTNERSHIP AND LAMELA CHOREOGRAPH THE MOVEMENT OF PASSENGERS UNDER A SENSUOUSLY UNDULATING ROOF.

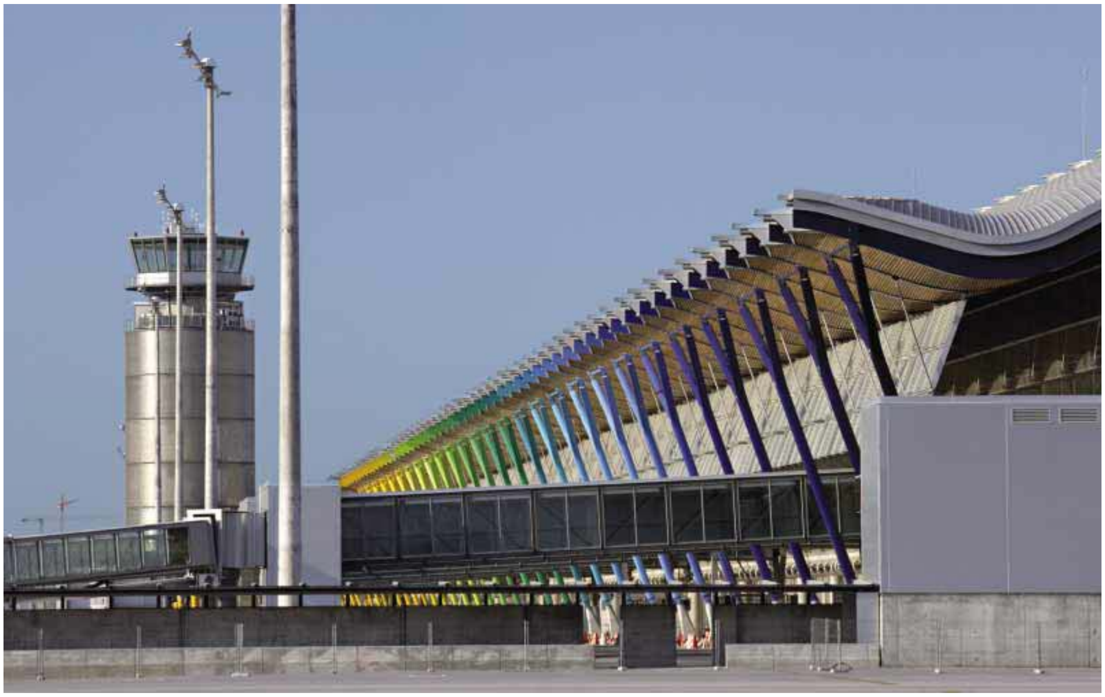
By David Cohn

Architect: *Richard Rogers Partnership and Studio Lamela*
Client: *AENA*
Consultants: *Anthony Hunt Associates, TPS with OTEP, HCA (structural engineering); Arup (facade engineering); TPS, INITEC (m/e/p); Warrington Fire Research Consultants (fire); Arup, Speirs and Majors Associates (lighting); INITEC, TPS (airport)*
General contractor: *UTE*

Size: *5 million square feet (main terminal); 3.4 million square feet (satellite); 38 gates total*
Cost: *883.5 million euros ($1 billion)*
Completion date: *January 2006*

Sources
Aluminum standing-seam roofing: *Corus*
Curtain wall: *Folcra; UTE*
Bamboo suspended ceiling: *Lindner AG*
Skylight lanterns: *IASO*
Limestone flooring: *Perlato from Levantina*
Lighting disk and reflector system: *Siteco + Siemens*
Elevators: *Thyssen; Krupp; Otis*

For more information on this project, go to Building Types Study at **www.archrecord.com**.



PHOTOGRAPHY: © RICHARD BRYANT/ARCAID, EXCEPT AS NOTED; AMPARO GARRIDO (OPPOSITE, TOP); KATSUHISA KIDA (OPPOSITE, BOTTOM)

As approached from the barren foothills that border the river floodplain on which it sits, the new terminal of Madrid's Barajas Airport is a glistening sea of roiling aluminum waves, its 25 acres of undulating roof barely held to the ground by its gaily painted supporting struts. Inside, vast halls and concourses stretch endlessly under this magic flying carpet, which extends protectively over glazed exterior walls.

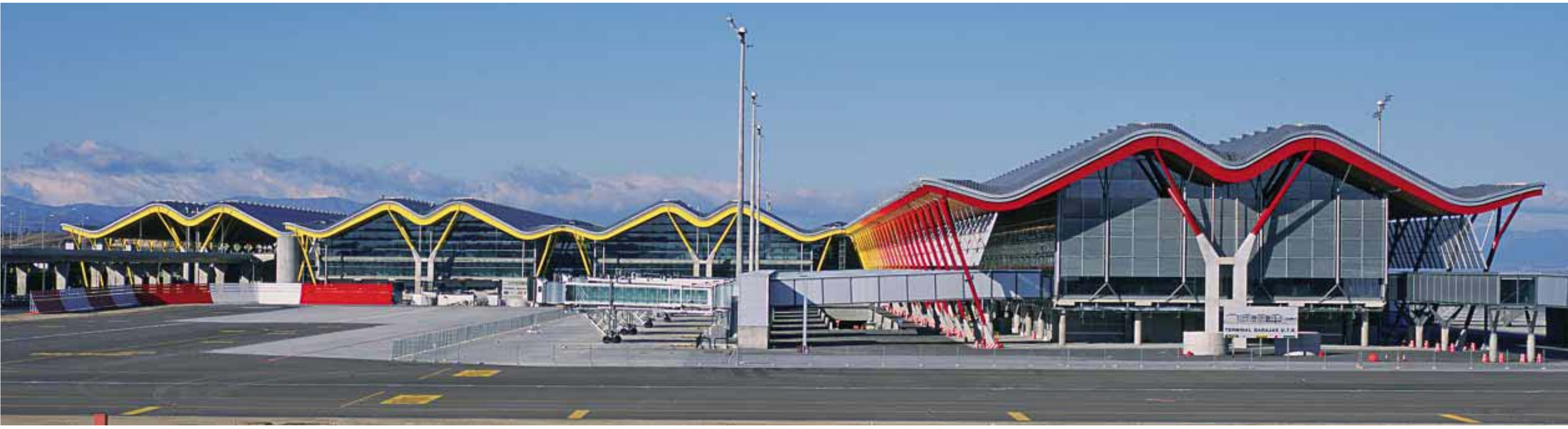
"The vision to build big and bold came from the politicians," confirms Simon Smithson, who headed the team from Richard Rogers Partnership for the project, which was jointly designed with Madrid's Lamela Studio. "There is a strong desire here to raise the profile of Spain within the European Union." The Spanish Ministry of Development viewed memorable architecture and generous passenger accommodation as essential to position Barajas as one of Europe's key airport hubs. (The obsolete and overcrowded main terminal is already Europe's fifth busiest.)

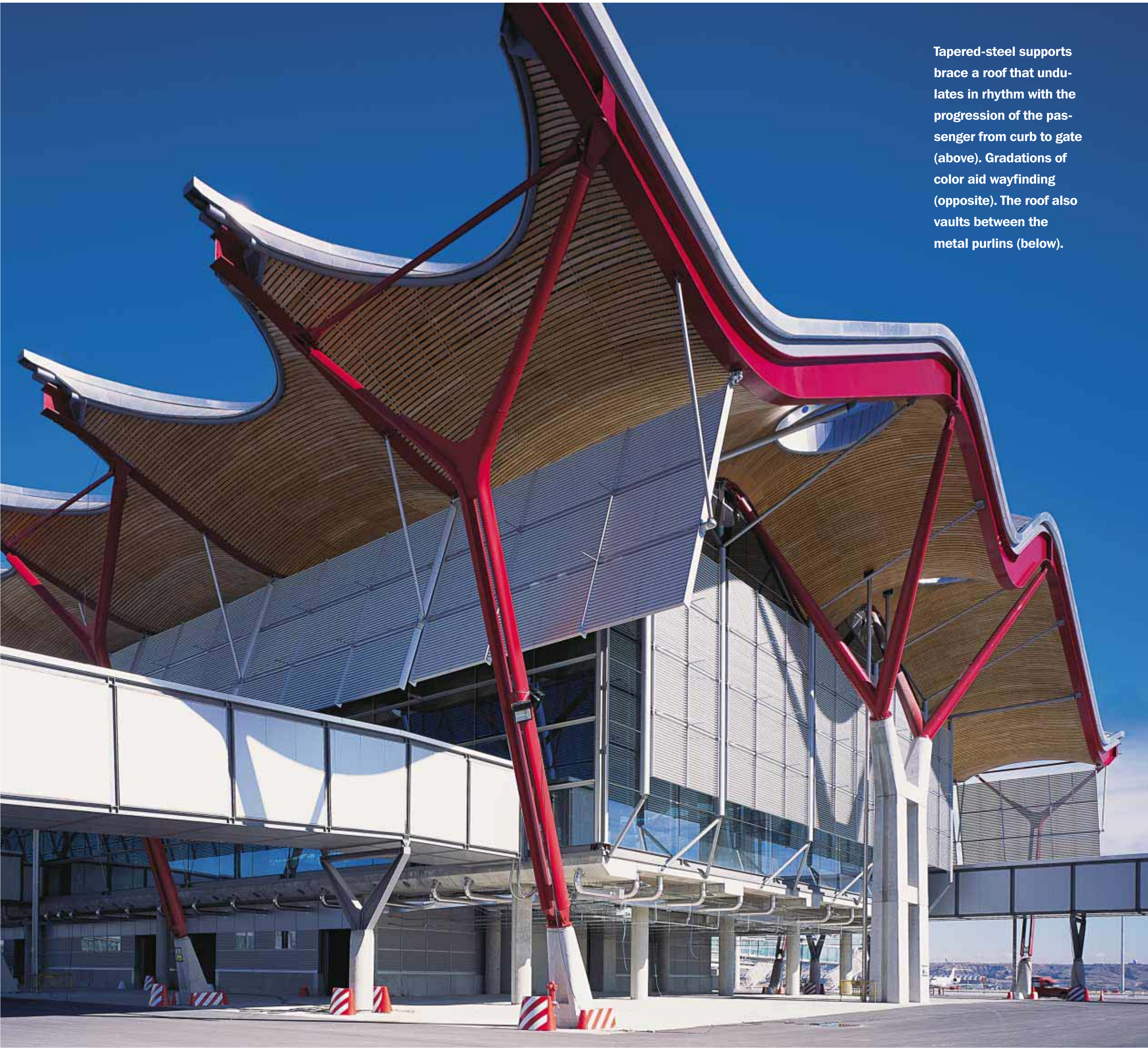
A 1997 competition for the terminal attracted teams led by Ricardo Bofill, Santiago Calatrava, César Pelli, HOK, Rem Koolhaas, Frank Gehry, and others. With his father Antonio, Carlos Lamela, principal of Lamela Studio, invited Rogers to join in a bid. Their combination of fresh international star allure—Barajas is Rogers's first commission in Spain—and Lamela's political connections with the reigning national government proved a winning one. The firms formed a single team for the project, an unusual collaboration that both describe as "exceptionally successful."

Program

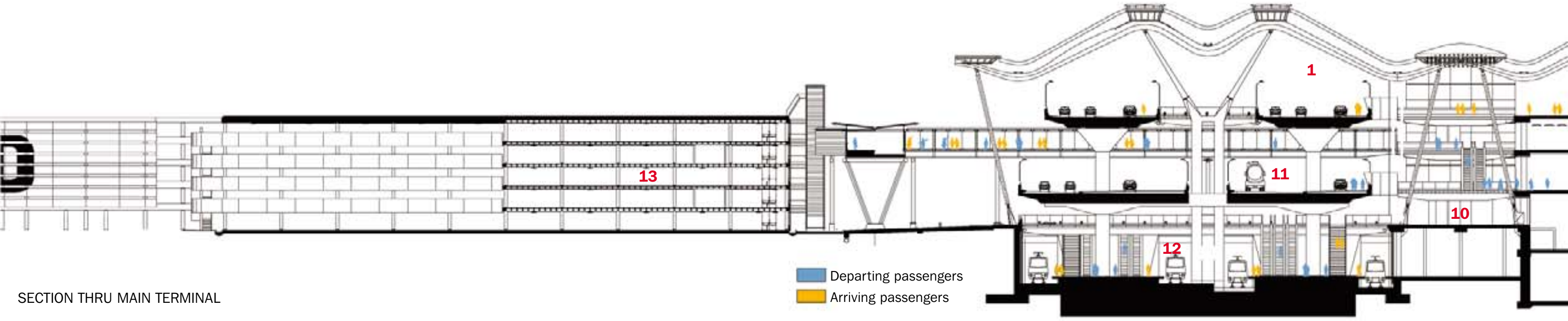
Together with two new runways, the new terminal increases Madrid's

David Cohn is RECORD's *Madrid-based Spain correspondent.*





Tapered-steel supports brace a roof that undulates in rhythm with the progression of the passenger from curb to gate (above). Gradations of color aid wayfinding (opposite). The roof also vaults between the metal purlins (below).



SECTION THRU MAIN TERMINAL

1. *Departure curb*
2. *Ticketing*
3. *Retail*
4. *Passport control/ security*
5. *Departure/arrival concourse*
6. *Train to satellite*
7. *Immigration*
8. *Baggage claim*
9. *Customs/immigration*
10. *Arrivals hall*
11. *Arrival curb*
12. *Train to terminals/ city (future)*
13. *Parking*

capacity from a current 25 million passengers per year to 70 million, with room for growth. The statistics are staggering: The main terminal covers 5 million square feet, with 174 check-in desks and 38 gates along a ¾-mile-long concourse. Underground automatic trains convey passengers to a 3-million-square-foot, 26-gate satellite concourse. The project includes 9,000 parking spaces, mass-transit platforms, and highway connections. The price tag was a cool $1 billion (883.5 million euros).

The expansion allows Madrid to postpone creating a distant megaport to replace Barajas, which is a convenient 8 miles from the city center. However, the new project's functionality will be compromised for years because the construction of a subway link between the new terminal and the existing ones, 1.5 miles away, is snarled in a political dispute over its financing. The airport will rely on buses for now.

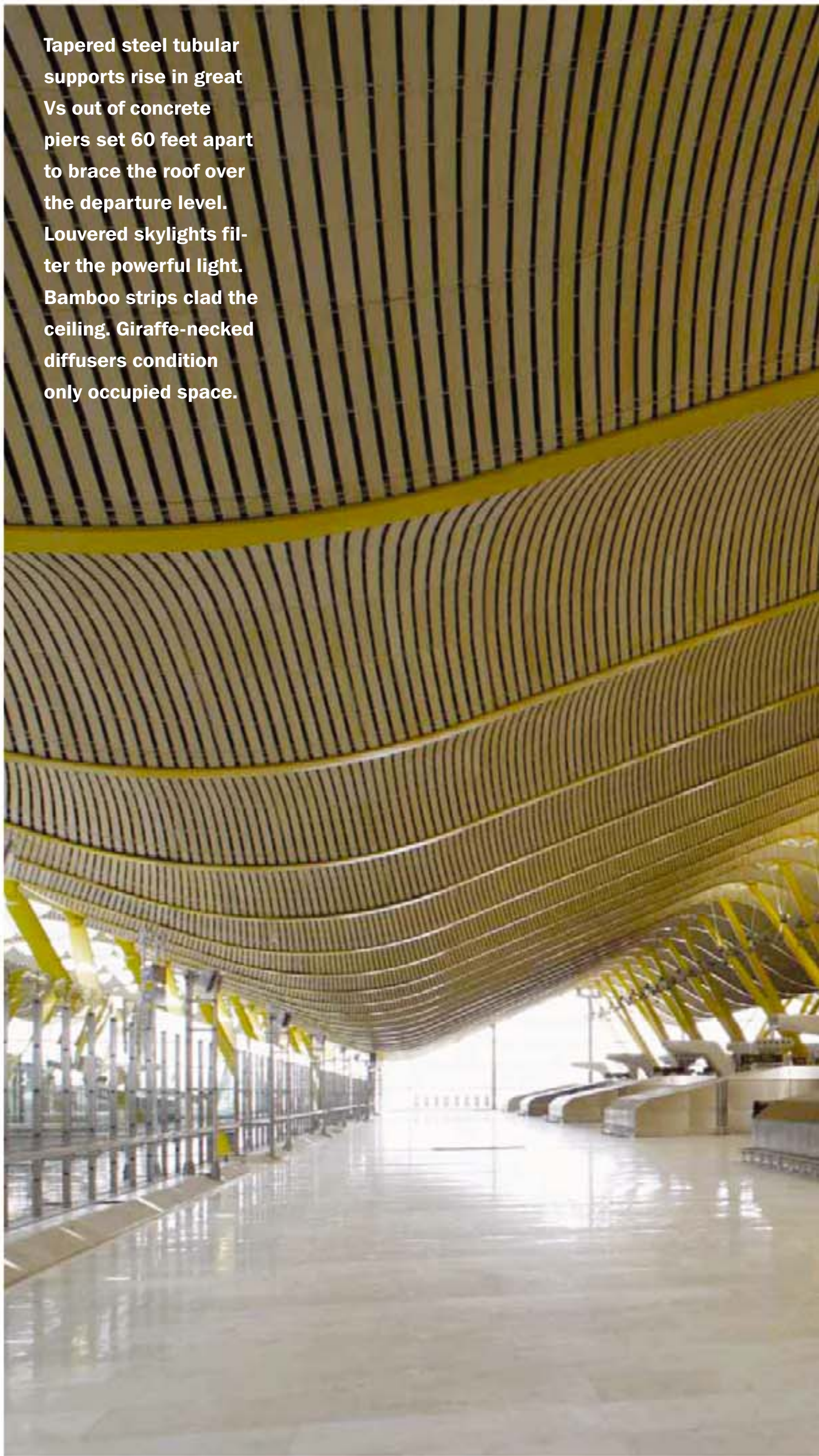
Solution

The enormous program is organized by long bays running parallel to the runways. Tapered steel supports rise in great Vs out of concrete piers to support a roof that undulates above the departure level in rhythm with the progression of the passenger from curb to gate. Narrow, daylight-flooded atriums open two levels down to the arrivals floor, punctuating the flow at intervals along the way. Glass-bottomed bridges span these canyons, which are lined with glass-sided elevators and sculptured open stairs and ramps. Passengers can look up from baggage carousels and see the sensuous roof curves gently lit by the diffused light. This alternation of dark and light, closed and open, structures the process of both departure and arrival, dispelling passenger disorientation and stress.

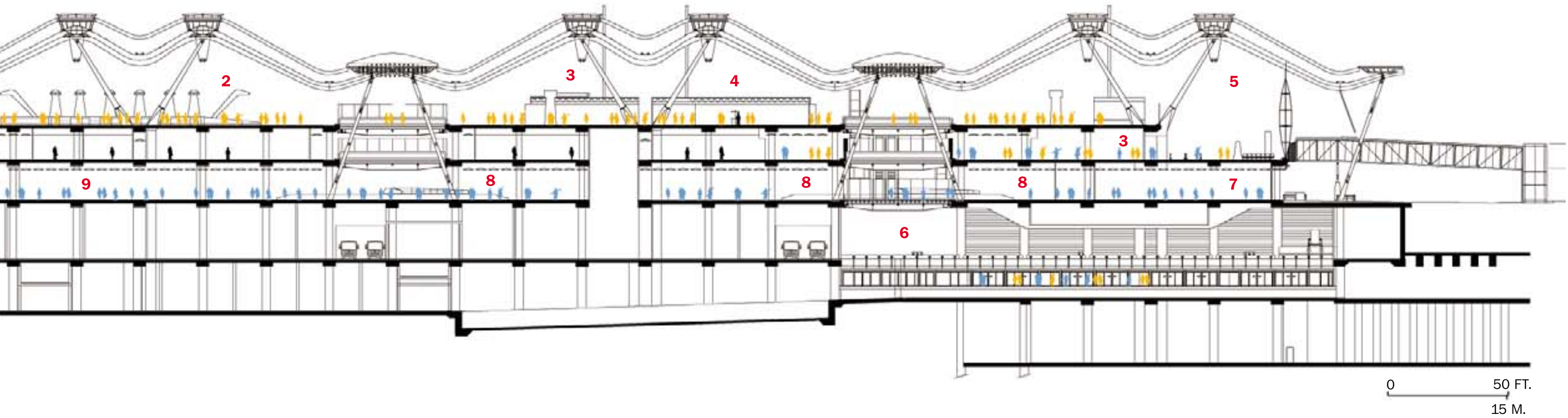
Given the inevitable changes the terminal will undergo over time, the architects established the broken floor plane and the high roof as defining, immutable design elements. Like a market hall, they expect that much of the floor area will fill with the elements that constantly change or adapt, such as concessions, security, and baggage handling. They hope to confine such "visual noise" as stores, signage, and other intrusions, but the architects have struggled to "protect the functional clarity of the scheme and the key architectural ideas," according to Smithson, as the retail and airline fit-out has proceeded. (It was still under way as this issue went to press, because a political dispute between airlines and the government delayed the opening, even though construction otherwise was completed early this year.)

The public concourses are conditioned by an energy-efficient displacement ventilation system, which uses low-velocity air delivered only to the occupied strata of space.

For Smithson and Lamela, the remarkable detailing of the facility—virtually every element was custom designed, from the elevator cabs to the structural steel—was not espe-



Tapered steel tubular supports rise in great Vs out of concrete piers set 60 feet apart to brace the roof over the departure level. Louvered skylights filter the powerful light. Bamboo strips clad the ceiling. Giraffe-necked diffusers condition only occupied space.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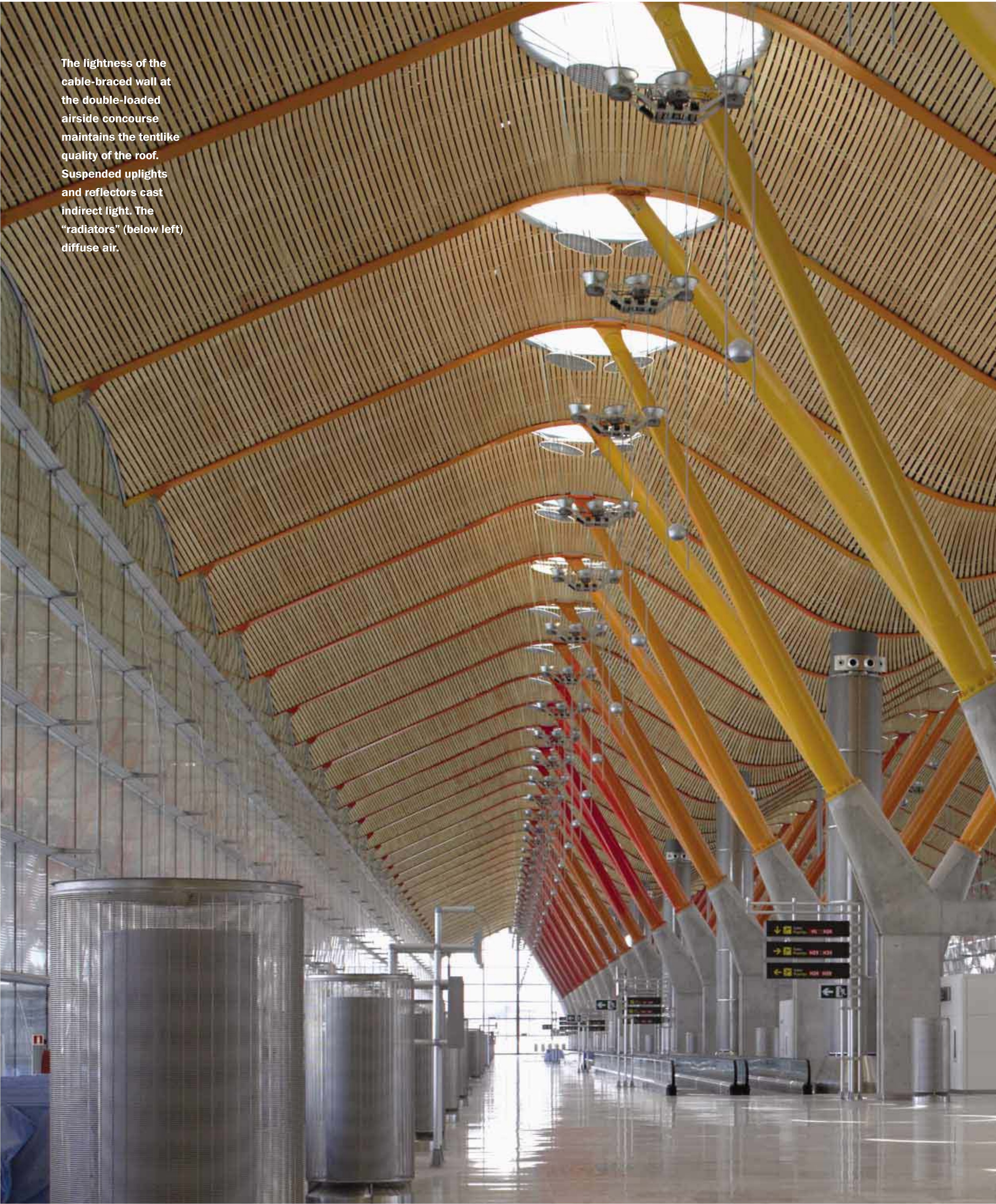
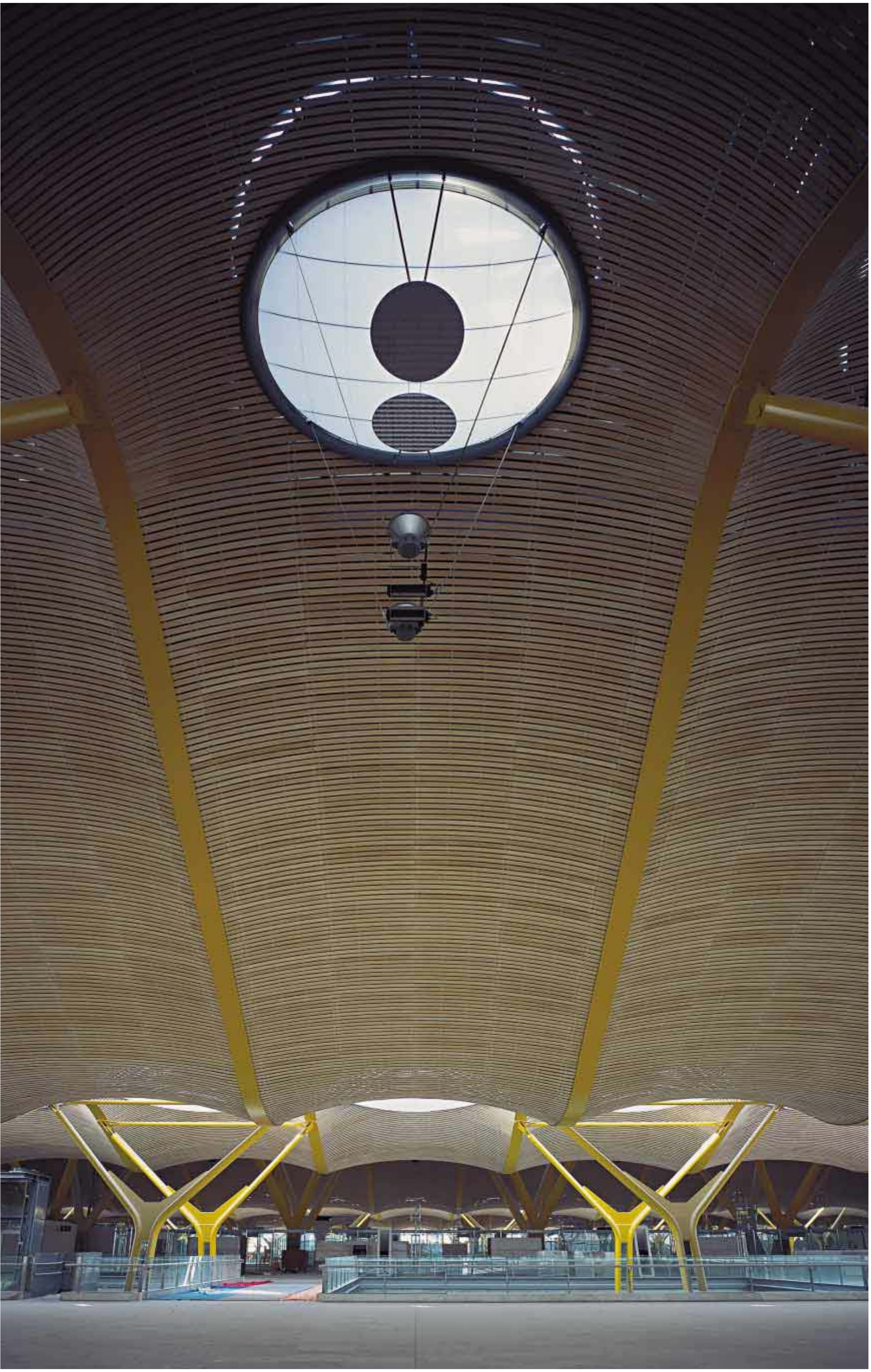


The lightness of the cable-braced wall at the double-loaded airside concourse maintains the tentlike quality of the roof. Suspended uplights and reflectors cast indirect light. The "radiators" (below left) diffuse air.



cially costly, given the scale of the project. Computer-assisted fabrication, and the fact that the cost premium for customizing elements is low compared to the U.S., kept costs competitive.

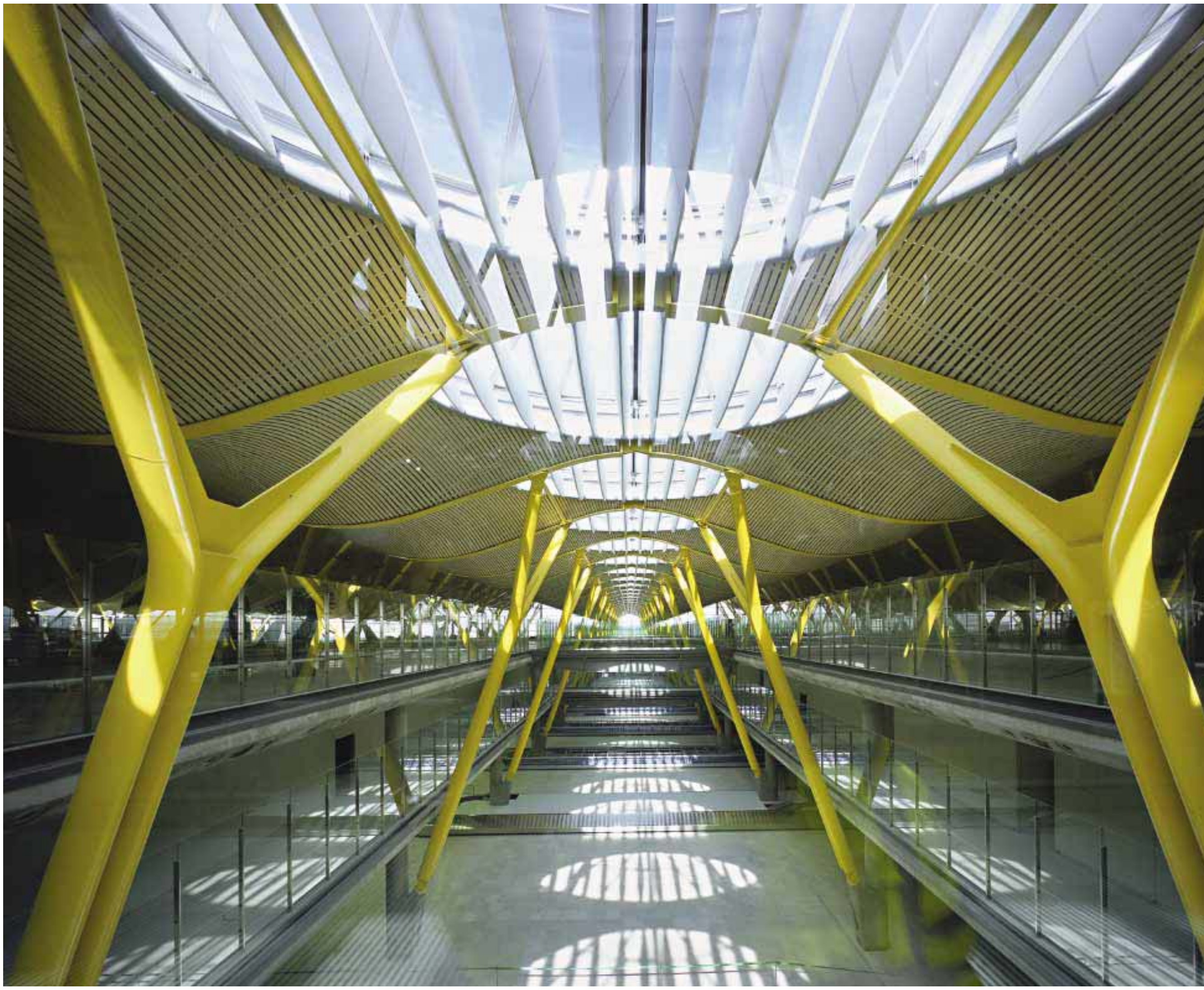
Smithson was impressed by the speed of the design-build process, which spanned nine years, even with the latest holdup. (The terminal will open to passengers in January 2006.) Rogers's Heathrow Terminal 5, by contrast, will have consumed 20 years by the time it opens in 2008. Smithson credits the progress to a lack of administrative snags and local-review hurdles. The broad political commitment to the project "overrides any public objections there might be." He also notes that costs were a third less than for a similar project in Britain.

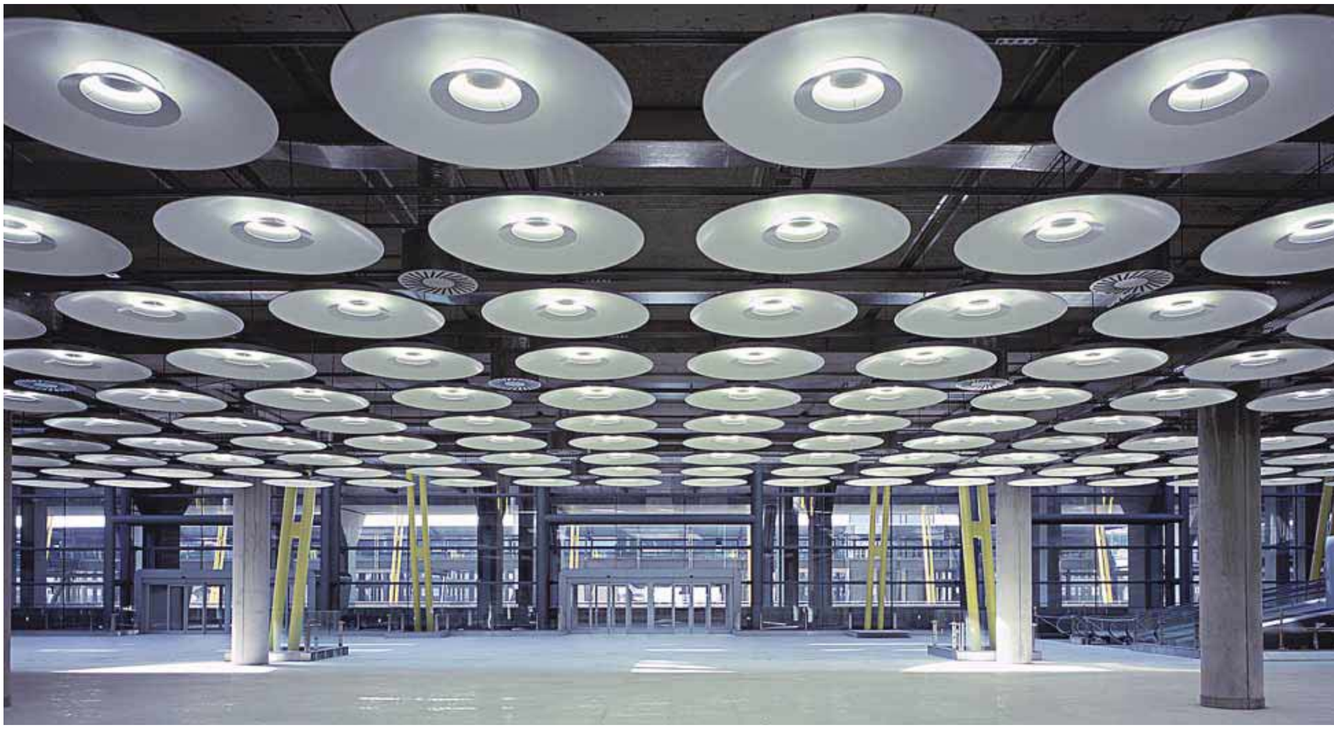
Commentary

The rolling aluminum coils of the terminal's roofline—in spite of the buildings' size—are not an impressive presence from the runways; their impact is stronger at close range, when pulling up to the departures curb under the extended roof. The architects have chosen to emphasize the interior experience of the terminal, and have studied how to make that experience more pleasant in every respect. The design gives measure to the daunting, dramatic scale of the space—as well as the endless march of its columns and canyons under its high roof—by the way the canyons and bridges punctuate each stage of the passenger's progression: arrival, check-in, security control, waiting and shopping, boarding, and so on. The terminal is like a forest floor, marked with paths and landmarks but leaving room for the imagination to roam. Rogers and Lamela have created a unique and memorable public forum, a contemporary update of the rhythmic vaults of Spain's Cordoba mosque, its Gothic cathedrals, or its 19th-century markets and train stations, bringing a sense of place and arrival to the anonymous, interchangeable spaces of international air travel. ■

PHOTOGRAPHY: © KATSUHISA KIDA (THIS PAGE); AMPARO GARRIDO (OPPOSITE TWO)

Light from glazed end walls and louvered skylights overhead bring what Smithson calls "Madrid's fantastic daylight and a sense of changing time" into "canyons" (right) that structure the passenger's progress by alternating light and dark (opposite). Arriving passengers traverse the building on the lowest main level, lit in part by "wok" fixtures (below). The architects intended that the broken floor plane and the high roof remain defining, immutable design elements, allowing demised zones beneath to adapt over time to changing needs.





Ben Gurion Terminal 3

Tel Aviv, Israel

2

MOSHE SAFDIE AND SKIDMORE, OWINGS & MERRILL HAVE CREATED A TRAVELERS' OASIS IN ONE OF THE WORLD'S MOST HEAVILY SECURED AIRPORTS.

By Andrea O. Dean

Architect: *Skidmore, Owings & Merrill (landside)—David Childs, FAIA, Roger Duffy, AIA, Marilyn Taylor, FAIA, T.J. Gottesdiener, FAIA, Hamid Kia, AIA, Michael Keselica, Ross Wimer, AIA, Guy Punzi, Reiner Bagnato, AIA, Herb Lynn, AIA; Moshe Safdie & Associates (airside)—Moshe Safdie, FAIA, Irit Kohavi, Michael McKee, Michael Guran, Isaac Franco, AIA, Hugh Phillips, Michael Joyce, Michael Kim, Craig Jacobs*
Associate architects: *Karmi Architects, Lissar Eldar Architect (landside); TRA (airside)*
Consultants: *Arup, Kahan, Muller Yaron Maller (structural engineering); Arup, B. Schor & Co., Dani Hahn, Lean Engineering, Y. Leshem Shachak (mechanical, communications, fire engineering); TAMS Consultants, Yani, D. Bar-Akiva (electrical); TAMS, Yosha, Abraham Schwartz (plumbing)*
General contractor: *Arenson*

Size: *2.9 million square feet (including parking), 24 gates*
Cost: *$1 billion*
Completion date: *2004*

Sources
Modified-bitumen roofing: *Siplast*
Curtain wall: *Alcan Deutschland (panels); Guardian (glass)*
Stone: *Jerusalem stone (walls, local source); Indian stone (tiles)*

For more information on this project, go to Building Types Study at **www.archrecord.com**.

In a nation surrounded by unfriendly neighbors, the thoroughness of security at Israel's Ben Gurion International Airport is legendary. Terminal 3 handles all of Israel's overseas air traffic, replacing Terminal 1, an outmoded remnant from the 1930s British Mandate over Palestine. Because the project's construction, begun in 1998, coincided with the four years of violent Intifada (the Palestinian uprising), it became a symbol of hope and the future.

The project was so large—2.4 million square feet, with an eventual capacity of 16 million passengers a year—that the Israel Airport Authority thought it best to hedge its bets by hiring two separate design teams. The New York City office of Skidmore, Owings & Merrill (SOM, with Karmi Architects of Jerusalem) was charged with overall planning and conceptual design and with responsibility for a structure that handles landside ticketing and arrivals functions. Israel-born architect Moshe Safdie's Cambridge, Massachusetts, firm (with now-closed TRA Associate Architects) designed a linking structure and the airside departure areas and gates. During the three-year design phase, the teams met at least monthly to shape the work into a coherent whole.

RECORD contributing editor Andrea O. Dean lives in Washington, D.C.

Program

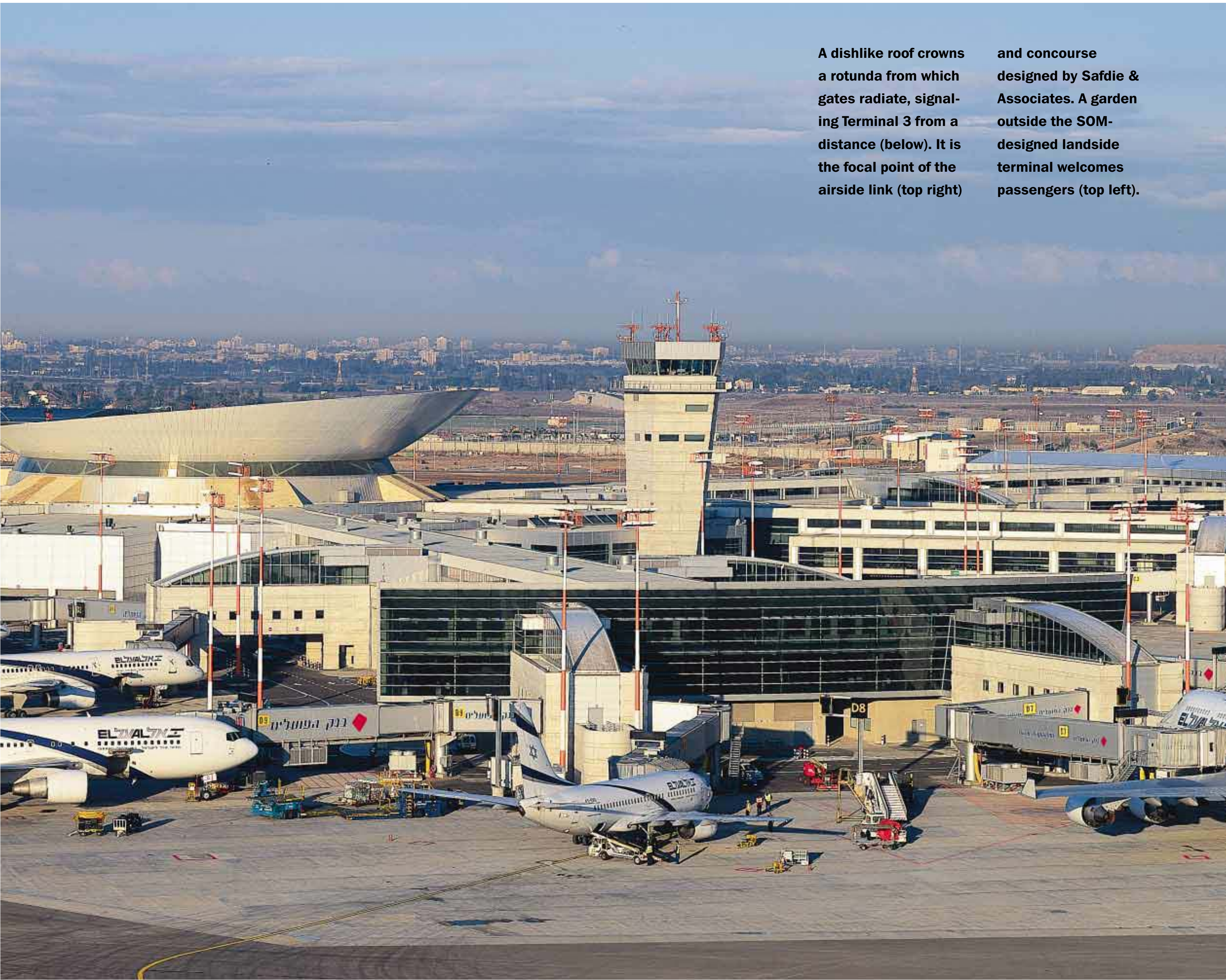
SOM and Safdie sought to avoid the generic appearance of many large international airports, in part by reflecting the country's culture and climate. Roger Duffy, SOM's principal in charge, wanted Terminal 3 to embody the dichotomy of daily life in Israel, "a modern society imbued with a sense of ancient history and culture." The extensive security procedures increase passenger wait time and tension, so Safdie and his team focused on making the passenger experience both calming and welcoming. Since Israel is both the actual home for many passengers and also the symbolic home for many Jews, the airport authority and the architects paid particular attention to dignifying the departure and arrival processes—experiences that can be particularly wrenching given the nation's short, violence-soaked history.

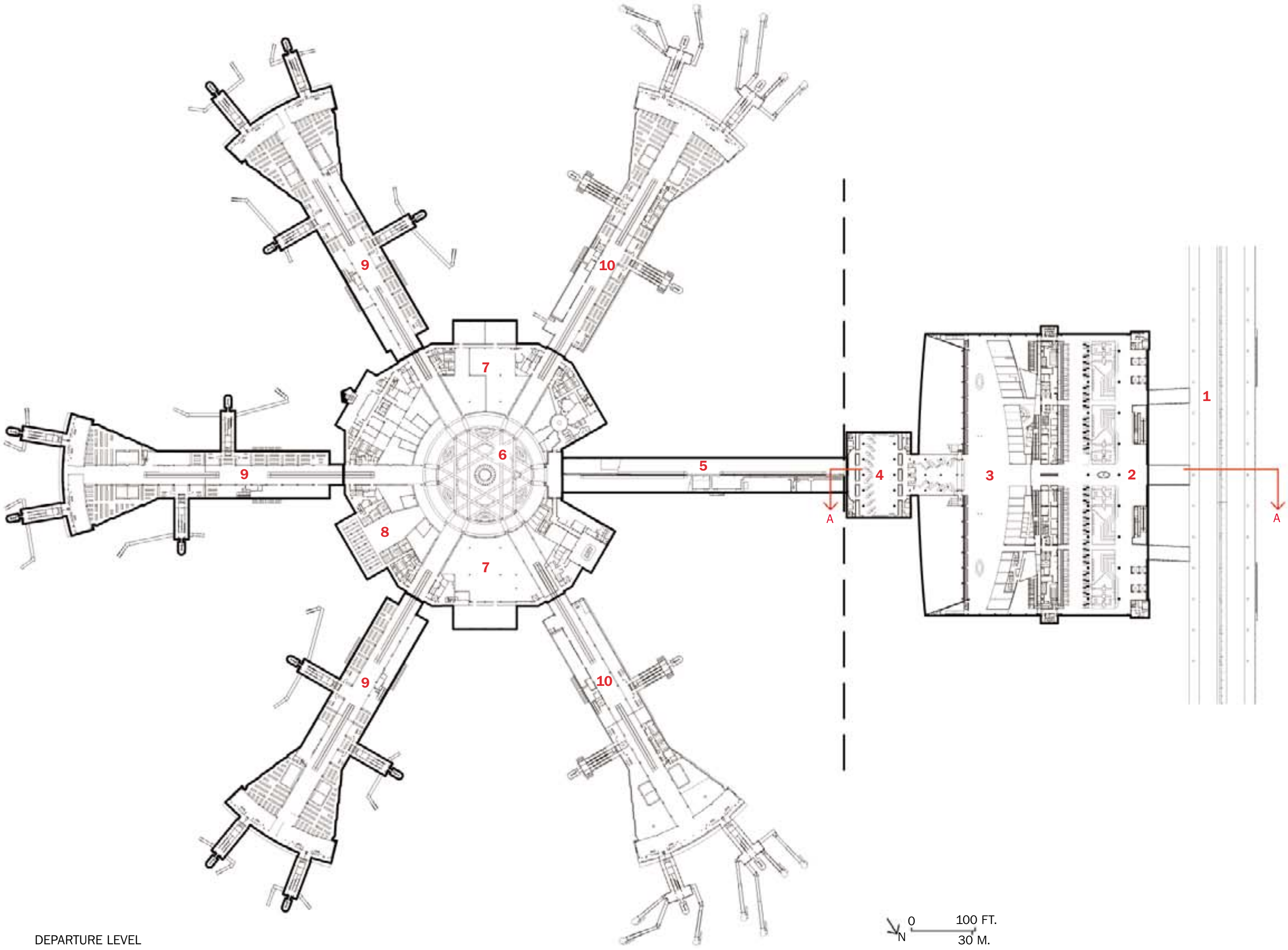
Solution

By car, a white dishlike cap identifies the terminal from a distance. An upper-level drop-off ramp is separated by a gap (a precaution against vehicle explosions) over a lower-level train station (section, page 160). Across from the terminal, a garden of native plants, including seven mentioned in the Bible, sets the stage. It's wrapped by the parking structure. Arcaded passageways take the passenger along the garden into the terminal, which is clad

PHOTOGRAPHY: © ALAN KARCHMER/ESTO

A dishlike roof crowns a rotunda from which gates radiate, signaling Terminal 3 from a distance (below). It is the focal point of the airside link (top right) and concourse designed by Safdie & Associates. A garden outside the SOM-designed landside terminal welcomes passengers (top left).

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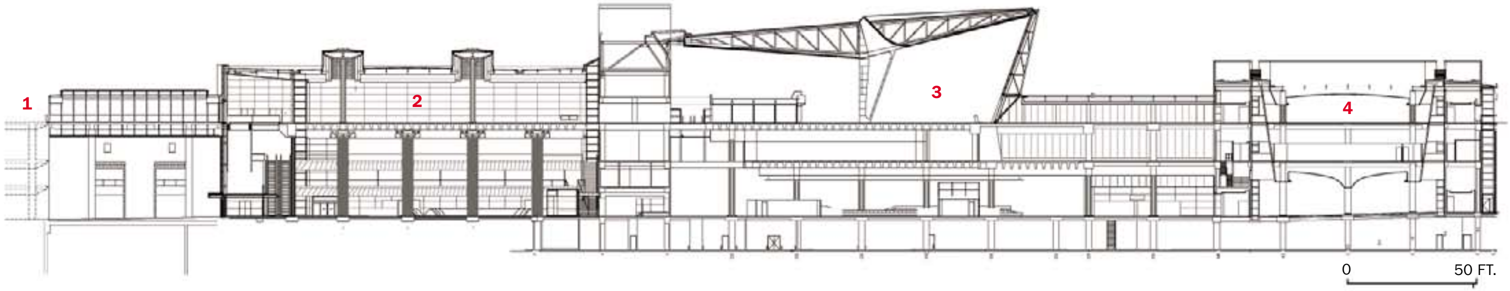
DEPARTURE LEVEL

1. *Drop-off and parking*
2. *Ticketing/ preliminary security*
3. *Departure hall*
4. *Security/ passport control*
5. *Link*
6. *Rotunda*
7. *Retail*
8. *Food court*
9. *Gate concourse*
10. *Future concourse*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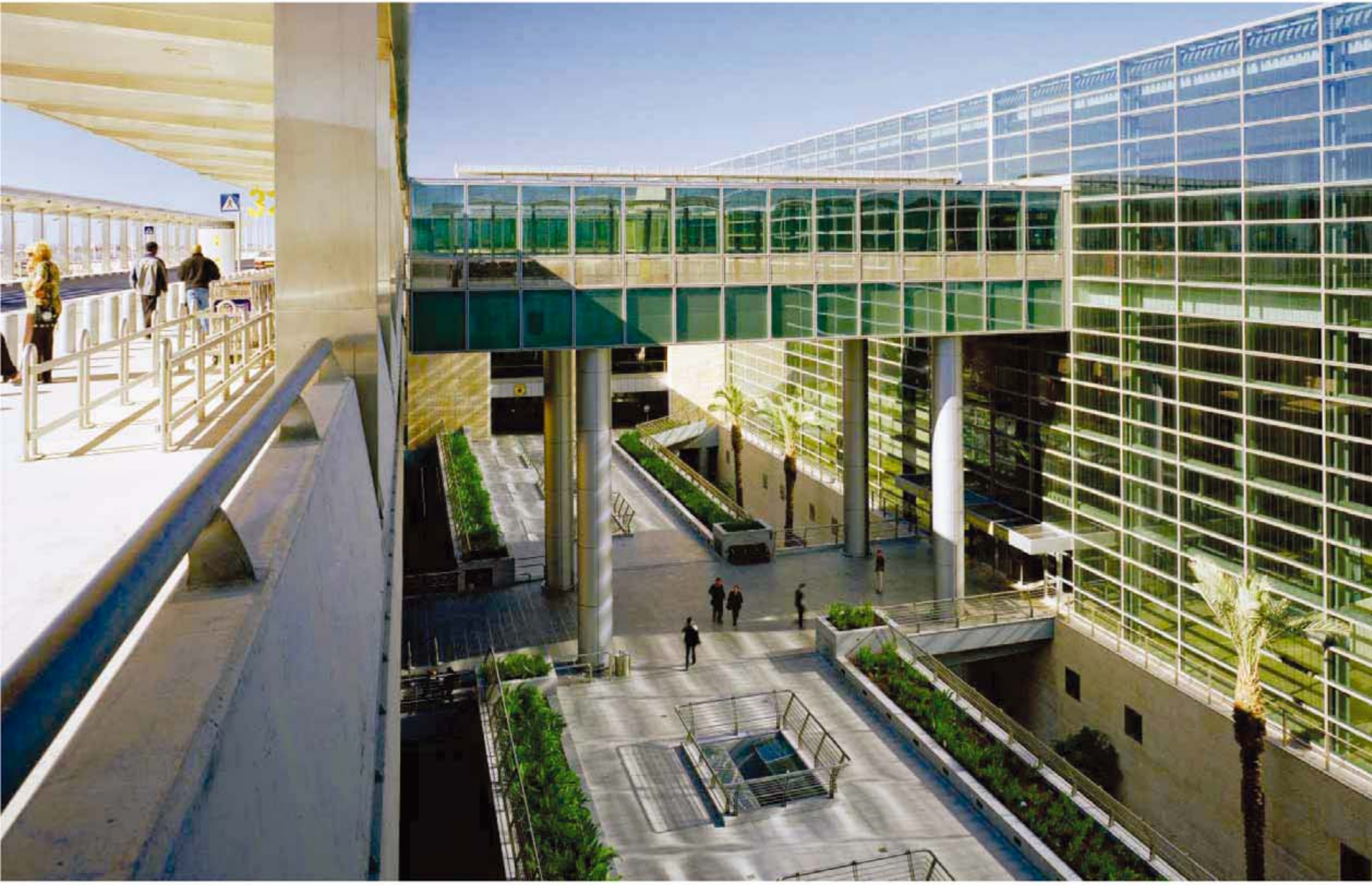
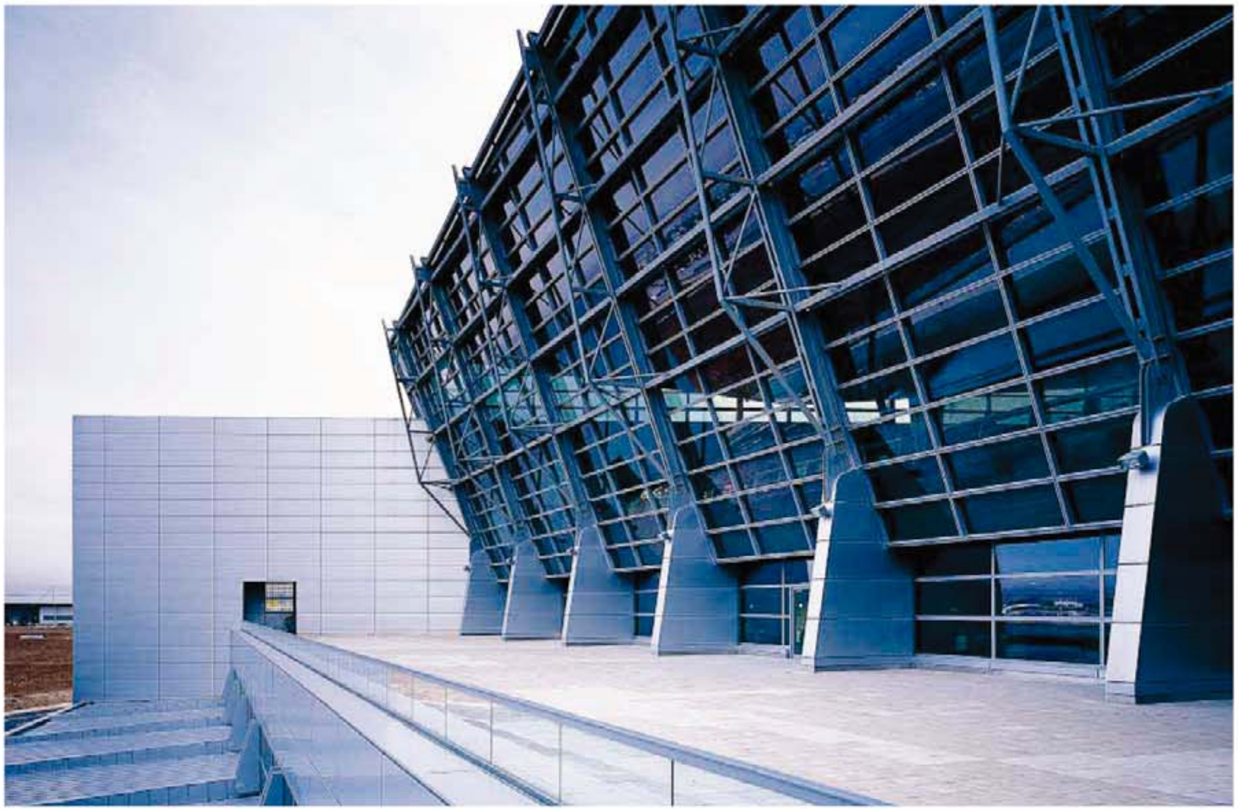
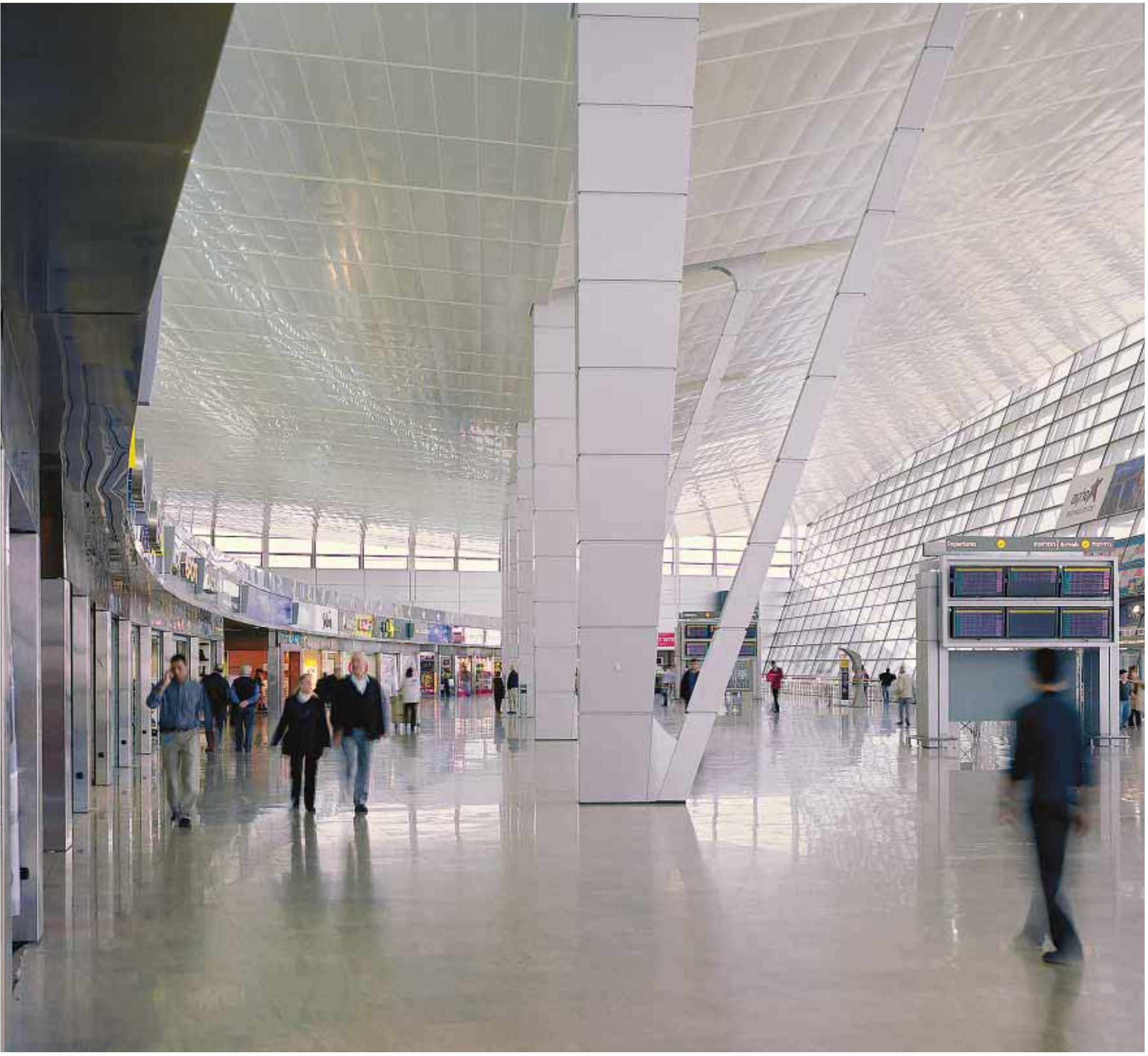
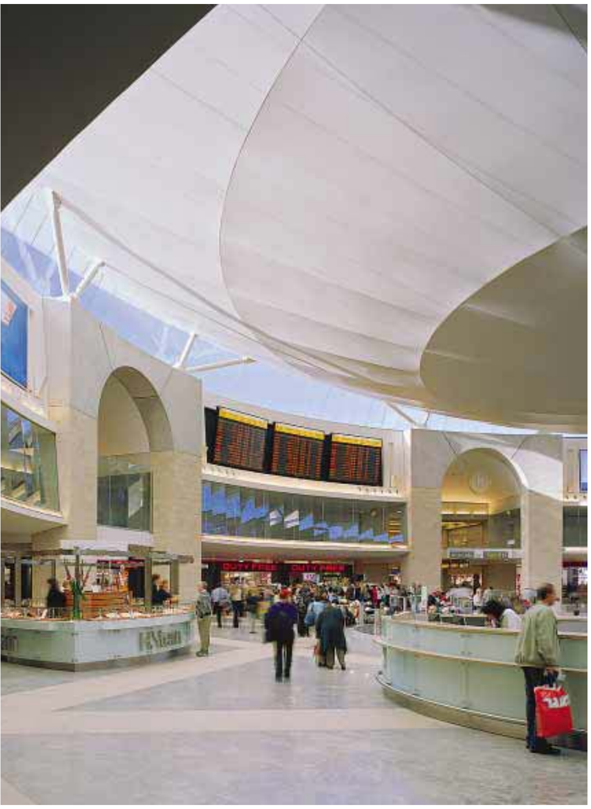
SECTION A-A

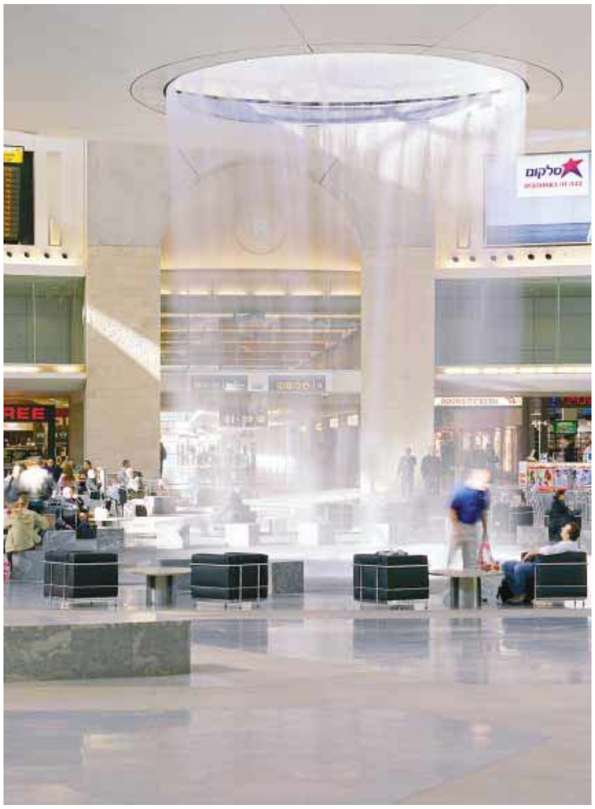




SOM separated access roads from the terminal itself as a precaution against vehicle explosions (top). The gap brings daylight into the multilevel landside departure and arrivals areas as well as a garden over a rail platform. The exterior wall facing the tarmac is also beefed up for blast-resistance (right). Steel members are used for long-span areas, with the main structure poured-in-place concrete.







in the same Jerusalem stone as the Wailing Wall.

Departing passengers pass through ticketing and undergo a preliminary security interview, which takes place against a 27-foot-high wall of Jerusalem stone, and then emerge to a soaring, glazed departure hall overlooking the tarmac. The hall looks poised for flight with its curving metal roof, angled stanchions, and blast-resistant floor-to-ceiling windows. Nontraveling friends and family are welcome in this hall, since the area precedes final passenger screening and passport control.

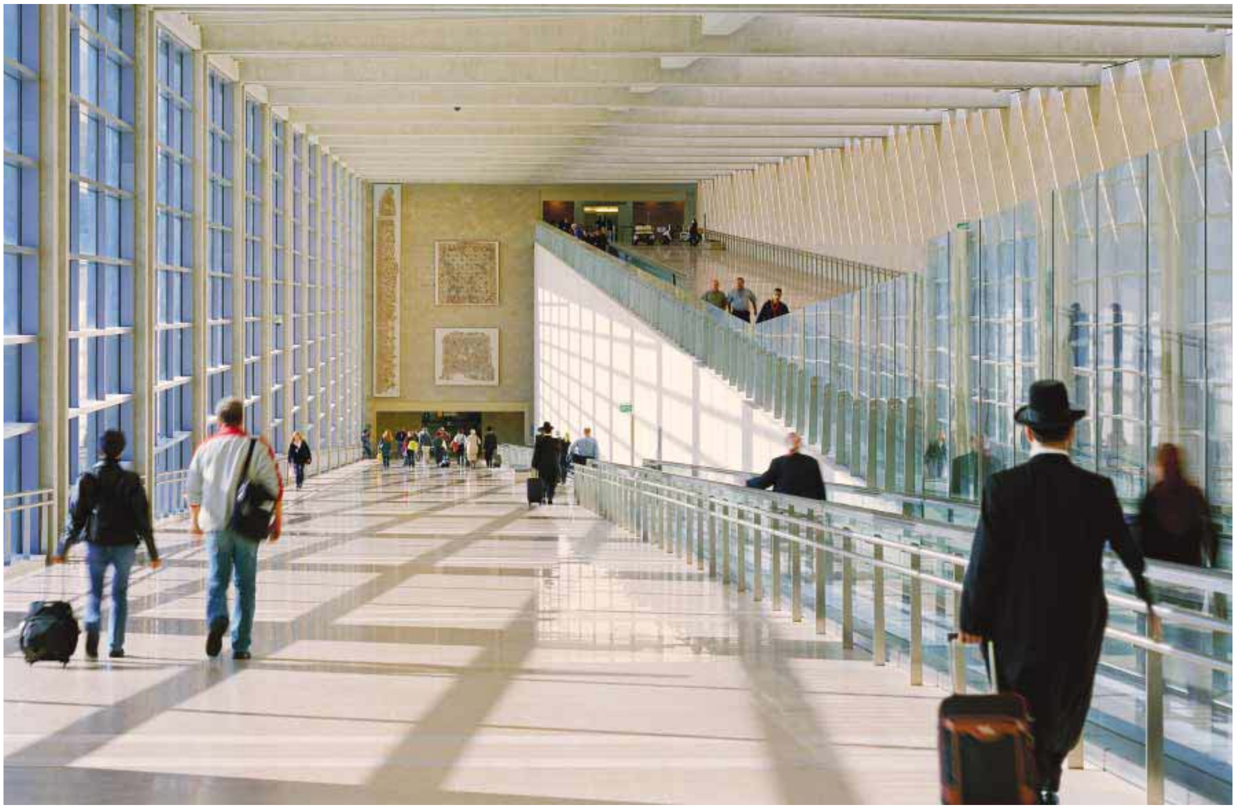
Israeli security depends more heavily on personal contact than on the machines that America's Transportation Security Administration favors. A handprint-recognition system speeds regular, preregistered passengers. But most are interviewed at the handbaggage X-ray machines by security personnel staring the passenger straight in the eye. The questions can be cursory, or quite elaborate if the answers raise concerns.

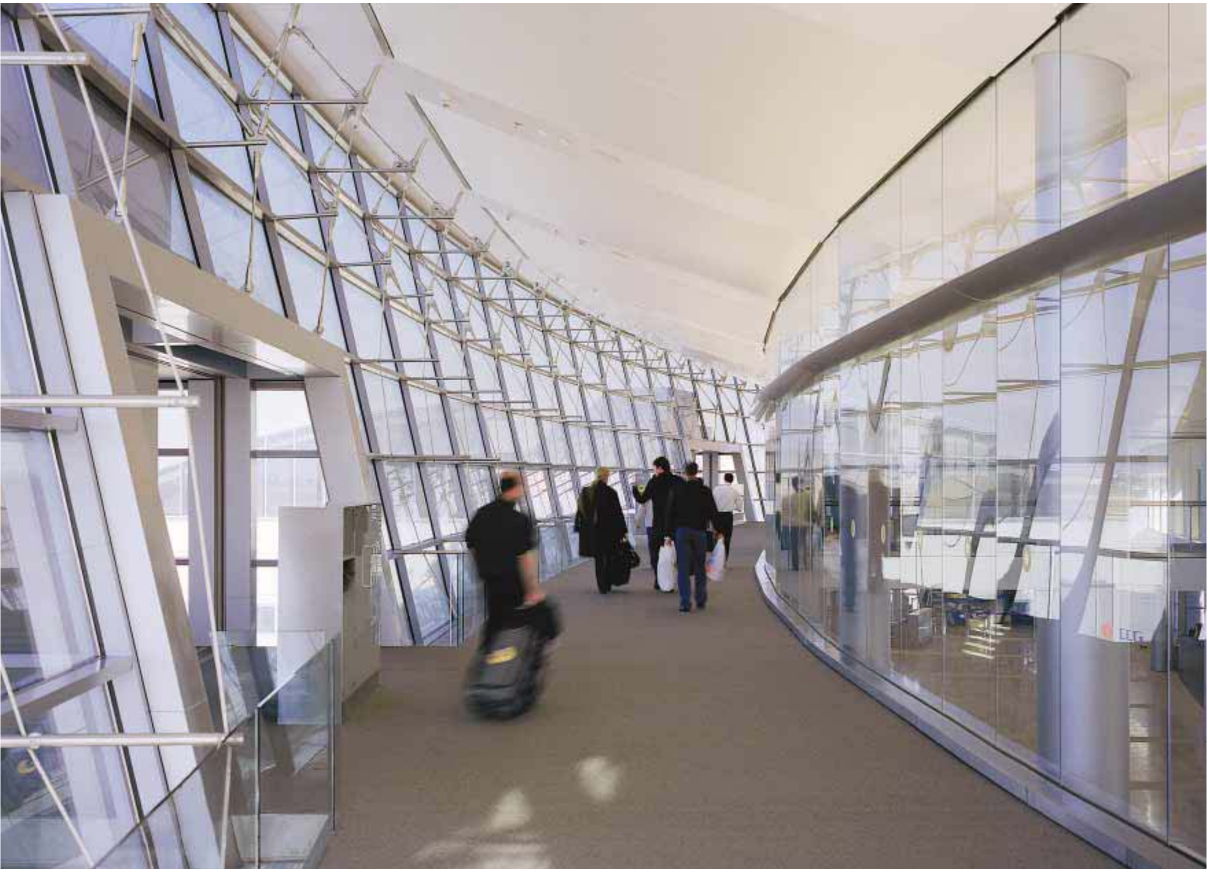
After this stressful experience, Safdie's glass-enclosed link to the airside concourse opens to calming panoramic views as it ramps down at a 5-degree slope, crossing a sloping ramp for arriving passengers, who, though physically isolated, are visible. "They feel the movement; it's a continuous experience," says Safdie.

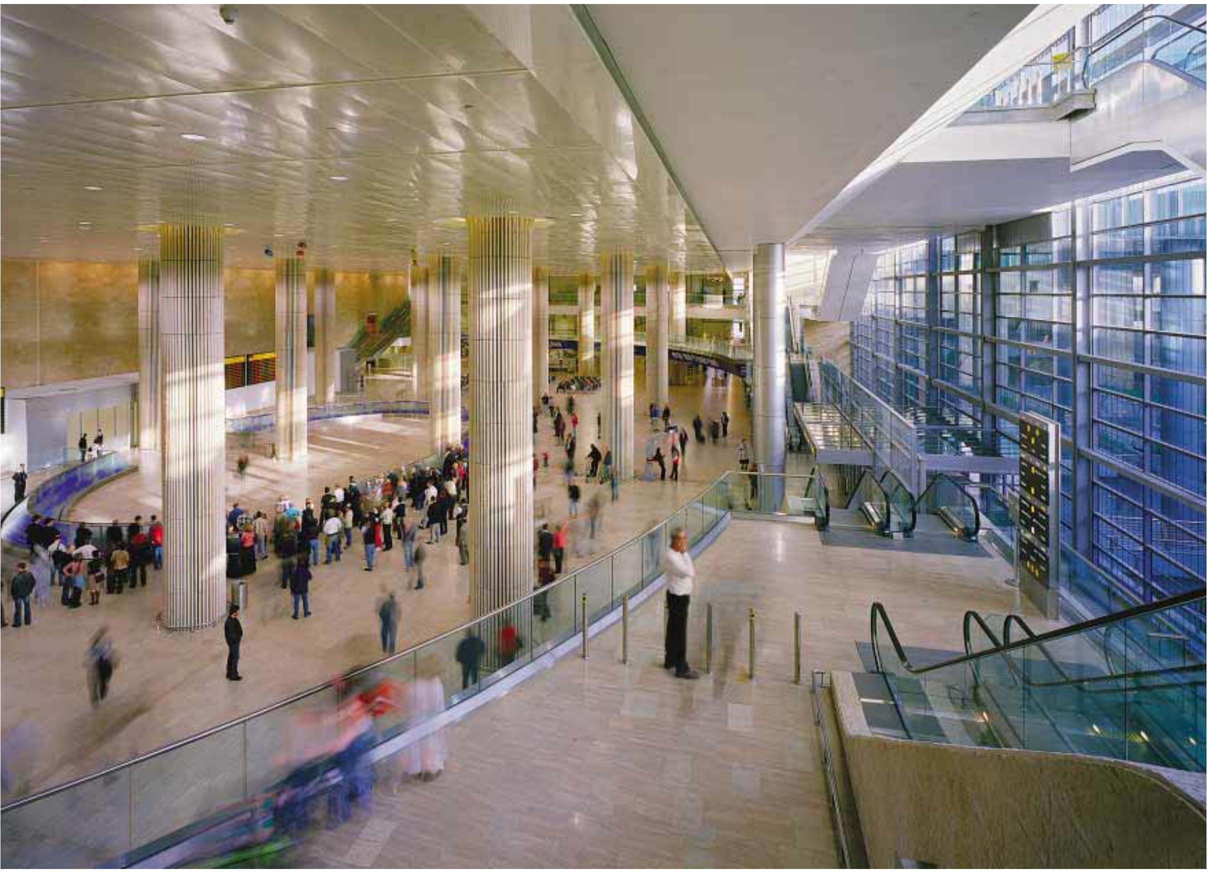
Irit Kohavi, Safdie's Israeli principal, further wanted to "de-stress" the experience, she says, by bringing in lots of natural light and using calming colors, shapes, and water. The connector leads to the duty-free rotunda, beneath that iconic, dish-shaped roof.

To non-Israeli's, the space may seem immoderately large, but it is what the client wanted. Extremely high sales taxes make tax-free goods especially attractive to residents, and departing passengers are even allowed to store tax-free goods until they return. Also immoderate in size and design are the rotunda's six arches. They surround an inverted dome that collects rain-

A generous departure hall accommodates extended-family good-byes (opposite, top). Clerestories light the retail rotunda (opposite, bottom left). Water streams from an oculus to create a serene place within the bustle of the duty-free area (opposite, bottom right). A link concourse choreographs the physically separate movement of departing and arriving passengers (above and right).







The "sterile" arrival corridor leading from the gates (top) allows passengers to see out but not mix with others until they have successfully negotiated customs and immigration. The light well outside the landside terminal enlivens the atrium that links the ticketing hall (opposite, upper level) with the arriving-passenger greeting hall (above), scaled to permit emotional reunions.

water, which periodically streams into the rotunda in the winter to create a serene place within the bustle of the duty-free area.

Arriving passengers, after exiting their aircraft, get a dramatic glimpse of the Judean hills before proceeding along a glazed corridor, crossing above the departure gates and duty-free rotunda. Often such corridors are windowless, but officials permitted Safdie to clad the corridor in clear glass. "There is a welcoming aspect to transparency," he says, "and for security purposes, it's better to have people visible than not."

The culmination of the process is a dramatic 40-foot-high arrival hall big enough to permit emotional, extended-family reunions. Sixth-century mosaics deepen the sense of welcome with a physical connection to ancient history.

Commentary

As a new national gateway, Terminal 3 abounds in symbol: It blends ancient materials and building conventions with modern, airy spaces; trades endless, confusing corridors for a sense of procession; and enlivens the process by at least visually uniting incoming and departing passengers. That makes it a pretty good model for most new airports. The marriage of Safdie and SOM proves architecturally to be a smooth one. Though each area has a distinct design temperament, the use of glass, metal, and concrete is almost seamlessly consistent. Safdie's work is less predictable: The rotunda is theatrical, but the terminal as a whole is elegantly detailed; the structure is the architecture. With the exception of that dramatic dish, the exterior is mundane. The upper-level drop-off also disappoints by offering a sawed-off view of the building and little sense of occasion. Once inside, however, the generosity of the departure lobby and the arriving-passenger greeting hall is exemplary. Being greeted by excavated 6th-century mosaics is far more welcoming than the usual anonymous signage. ■

Leumi Israel's Leading Bank
Directory

Terminal D Dallas/Fort Worth

Dallas, Texas

3

HNTB, HKS, AND CORGAN REINVENT A 1974 PROTOTYPE AS A MASSIVE HUB FOR TRANSFERRING INTERNATIONAL TRAVELERS.

By James S. Russell, AIA

Architect: *HNTB—Vlasta Poch, AIA, Steve Reiss, Lee Glenn; HKS—Wesley Wong, AIA, Rick Lee, AIA, Paul Gowan, AIA, Trey White, Erik Moorhead, Joe Gonzales, Mike Wahl; Corgan Associates—Phil Mein, AIA, Chuck Armstrong, AIA, Ralph Bauer, AIA, Jeff Mangels, AIA, Brent Kelley, AIA, Jennifer Johnson, AIA, Ross Payton, AIA*

Engineers: *L.A. Fuess Partners, Campbell and Associates, Walter P. Moore (structural); Friberg Associates, Carter + Burgess, LopezGarcia Group, DFW Consulting Group (m/e/p)*

Consultants: *Carol Naughton & Associates (graphic designer); Arup (fire protection); Center for Airport Management (concessions planning)*

Size: *2 million square feet, 23 to 28 gates, depending on configuration*

Cost: *$1.2 billion*

Completion date: *July 2005*

Sources

Roofing: *A. Zahner (stainless steel); Sarnafil (elastomeric)*

Curtain wall: *Kawneer*

Metal panels: *Reynobond*

Glass: *Viracon*

Wall finish: *Trespa*

Acoustical ceilings: *Simplex; Armstrong*

For more information on this project, go to Building Types Study at **www.archrecord.com**.

Dallas/Fort Worth (DFW) airport was conceived on a Herculean scale when it opened in 1974. On a 27-square-mile site, the engineering/architecture firm of TAMS designed four terminals (of a once-planned 13), each with close to 40 gates, each intended as the ultimate in intermodal convenience. You motored to your terminal along a dedicated superhighway bisecting the airport and parked practically in front of your gate.

PHOTOGRAPHY: © BRAD FEINKNOPF, EXCEPT CRAIG BLACKMON (THIS PAGE)

That great vision didn't last. Airplane hijackings led to higher security, ending that easy passage to the gate. Later, those long, single-loaded terminals proved poorly adapted to the great numbers of transferring passengers that flooded DFW after American Airlines established its primary hub at the airport in 1981. Distances (both within and between terminals) proved to be too long.

Since almost three quarters of passengers arriving at DFW change planes, the $1.2 billion Terminal D represented the first opportunity to fix what has long ailed America's fifth-busiest airport.

Program

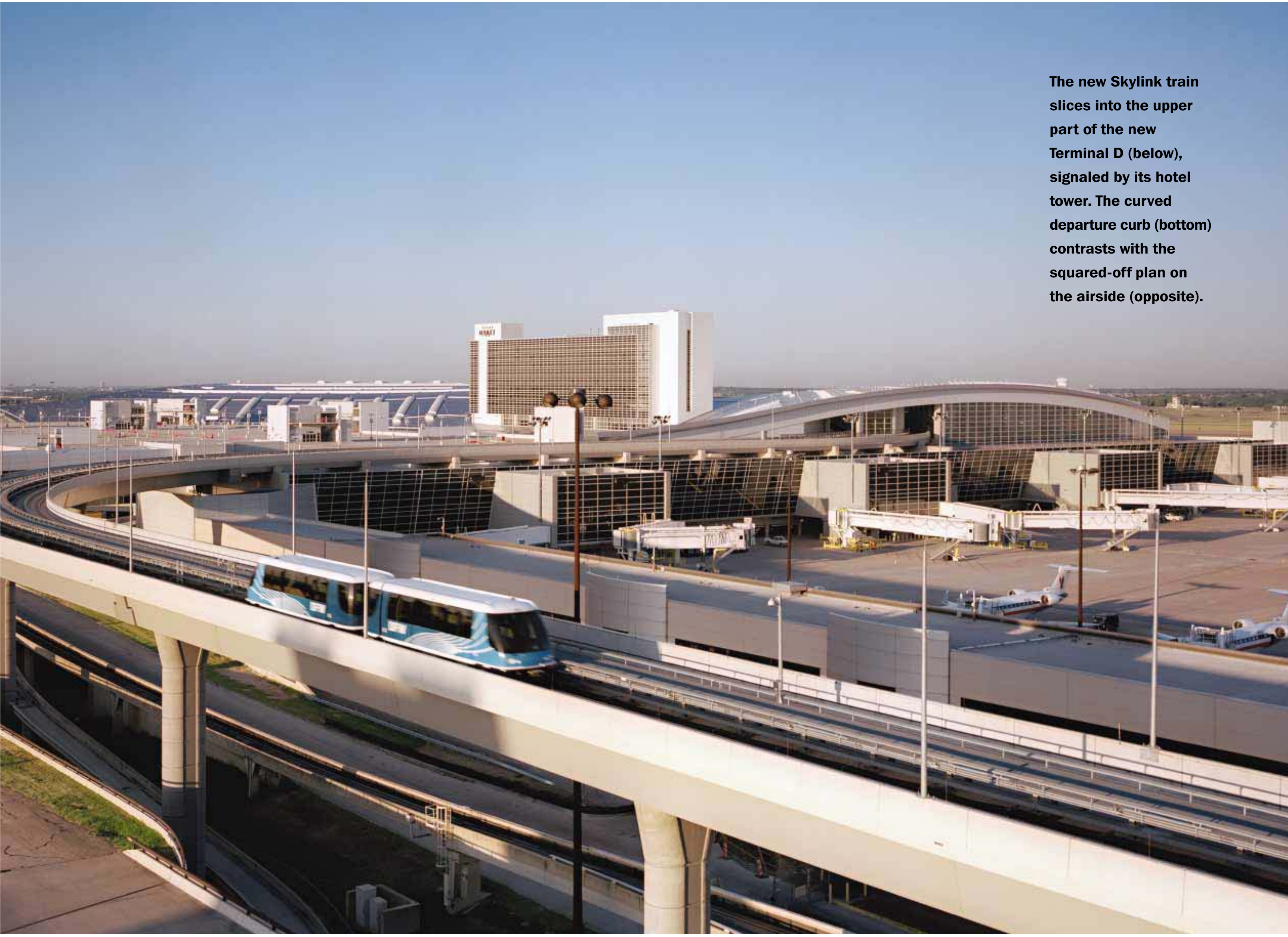
According to R. Clay Paslay, the airport's executive vice president, Terminal D consolidates international arrivals and departures scattered previously in three terminals. Some of its 28 gate positions can be arranged to accommodate the new Airbus A380 superjumbo. Since 70 percent of international passengers will connect to domestic flights, the terminal programmed generous concession space, airport lounges, and even a 289-room Hyatt hotel for between-flight relaxing or business meetings.

"This is the port of entry to our community," explained Paslay, "We wanted a sense of welcome and efficiency for passengers. The focus was on customer service: openness, an ability to see out, to see the airfield—an experience that is the opposite of being cooped up in a plane." The airport asked that moving walkways or trains reduce distances passengers have to walk to no more than 2,000 feet.

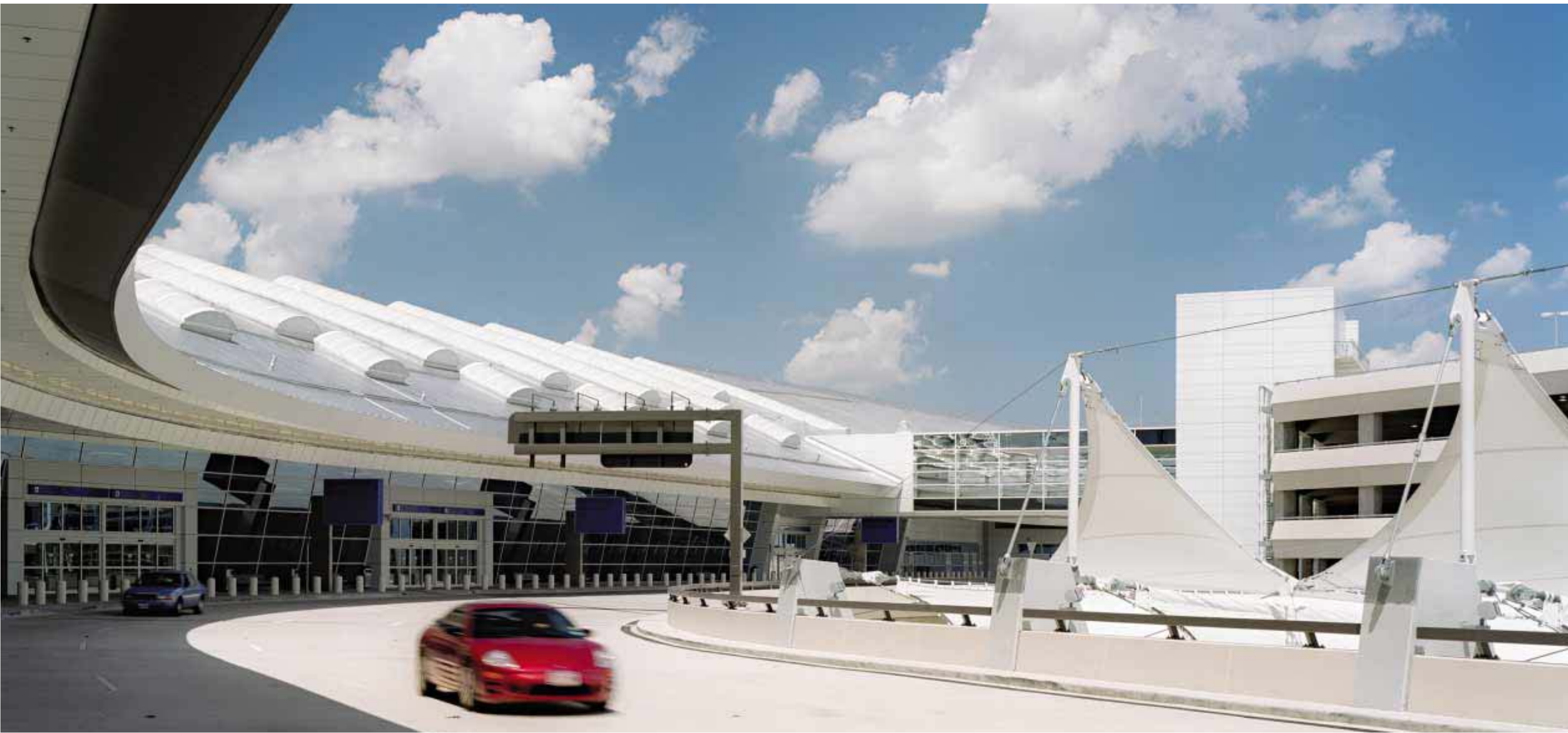
Solution

The airport brought together three firms: architect/engineer HKS, which had a longtime relationship with the airport; the Dallas office of engineer/architect HNTB, with its decades of airport master-planning experience; and architect Corgan Associates, associated with American Airlines, still DFW's dominant carrier. Concerned that such a forced marriage might not take, DFW instructed the firms to come up with an acceptable design in six months or be fired.

The designers considered finger piers and airside terminals,



The new Skylink train slices into the upper part of the new Terminal D (below), signaled by its hotel tower. The curved departure curb (bottom) contrasts with the squared-off plan on the airside (opposite).



solutions which would have reduced distances to gates because they could be double loaded. DFW decided that the extent of airside modifications and the cost were too much. Instead, the airport accepted a scheme that stretched the arc that had long defined the airport's terminals into a still single-loaded, squared-off U shape (plan, page 169). Paslay explained that gates could be fitted closer together this way. Inside, passengers find their way more readily because the long sides of the U make long rows of gates visible at once.

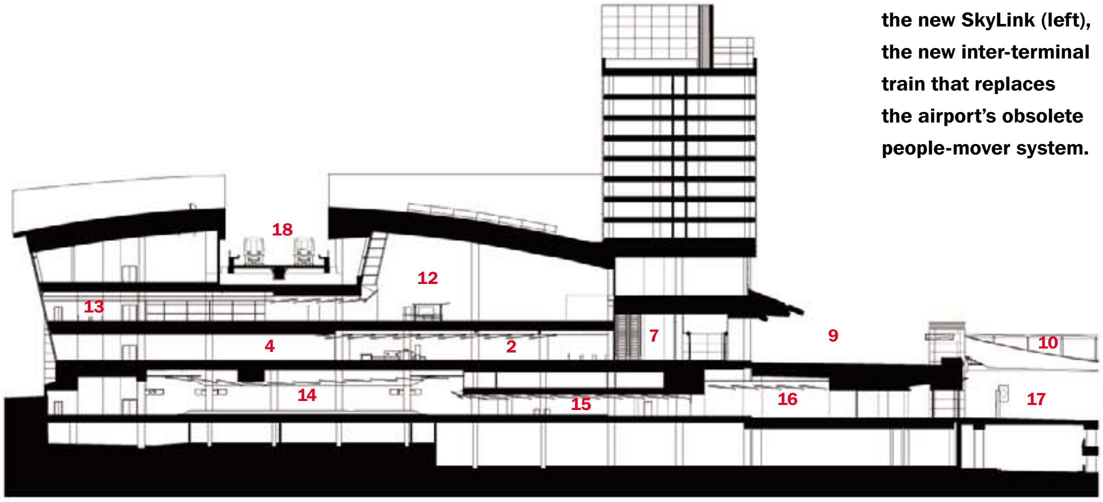
The three firms contributed to a common studio, but agreed to designate HNTB the lead designer, HKS as project manager, and Corgan as architect of record in charge of document production. Because local law does not require lowest bid as the basis for selection of the contractor, DFW structured the project as design-build, bringing in contractors Hansel Phelps and Austin Commercial.

On the landside, the curved access roadways open to 99 ticketing positions in two main ticketing halls. (A third, in the middle, primarily serves international passengers rechecking for domestic flights.) Under the roof, travelers pass through several separate, daylighted, high-ceilinged spaces.

Gate towers, serving two jetways each, accommodate arriving domestic passengers on the departure level. Elevators and escalators convey arriving international passengers up one level, where they move to customs and immigration along a glass-enclosed mezzanine that puts both the airfield and the departure concourse in view. Only recently have immigration authorities permitted such visibility prior to customs and immigration checkpoints. (Cell phones, it seems, eroded whatever security purpose windowless corridors once served.)

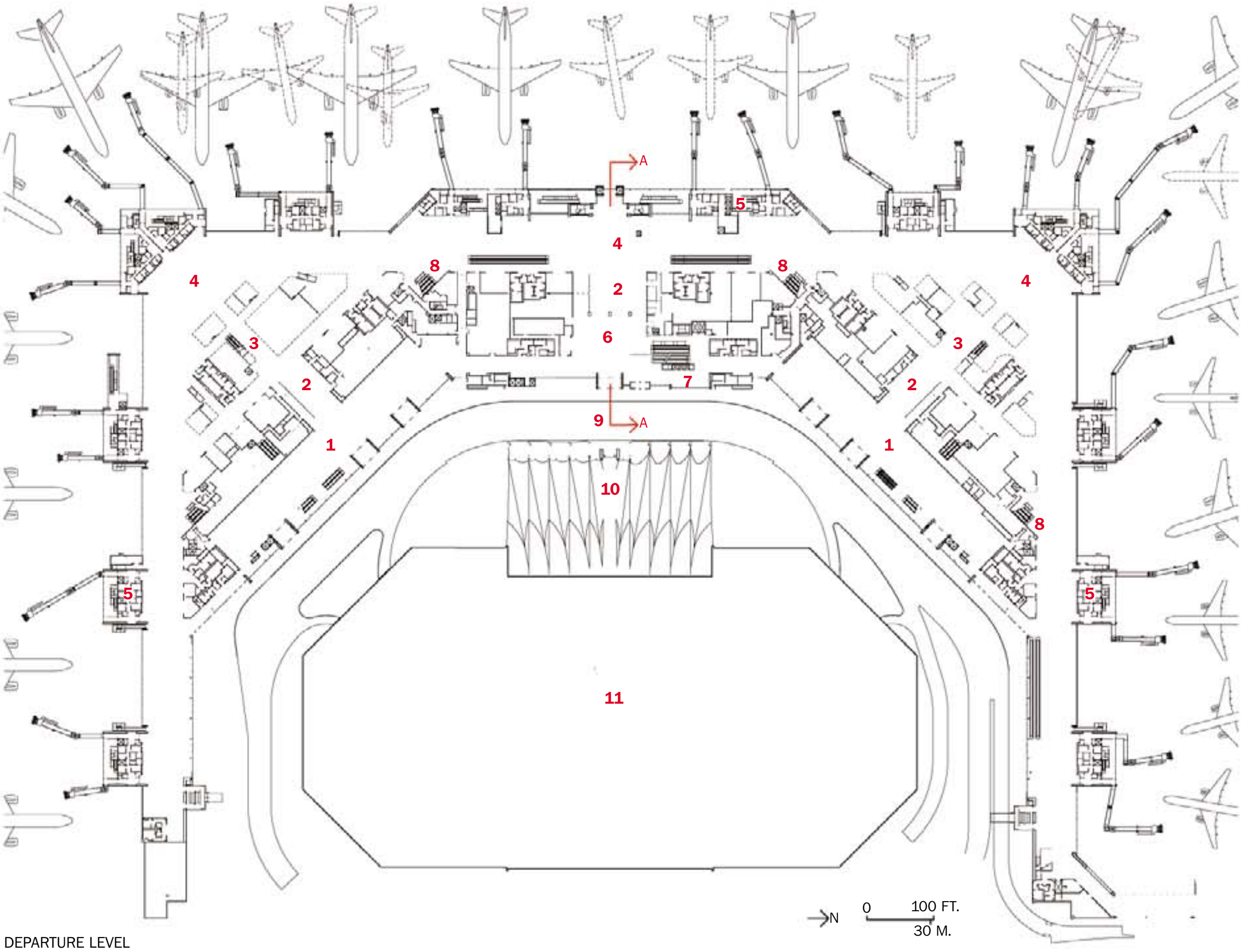
The Hyatt hotel rises above the central ticketing hall. Its lobby, restaurants, bars, and meeting rooms have been styled in a calming palette of wood and fabric.

Netlike double-curving arcs in CAD reconcile the curving landside edges of the stainless-steel roof with the diagonal passenger movement, and the straight airside edges (above). The gentle vaults conceal segmented steel trusses supported on an 85-foot-square grid. The roof also rises around the new SkyLink (left), the new inter-terminal train that replaces the airport's obsolete people-mover system.



SECTION A-A

1. *Ticketing*
2. *Security*
3. *Shopping*
4. *Concourse*
5. *Gate tower*
6. *Domestic passenger recheck*
7. *Hotel entry*
8. *SkyLink access*
9. *Departure curb*
10. *Roof over arrival curb*
11. *Parking*
12. *Immigration*
13. *Lobby to customs*
14. *International baggage claim*
15. *Customs*
16. *Meeting/greeting hall*
17. *Arrivals curb*
18. *SkyLink*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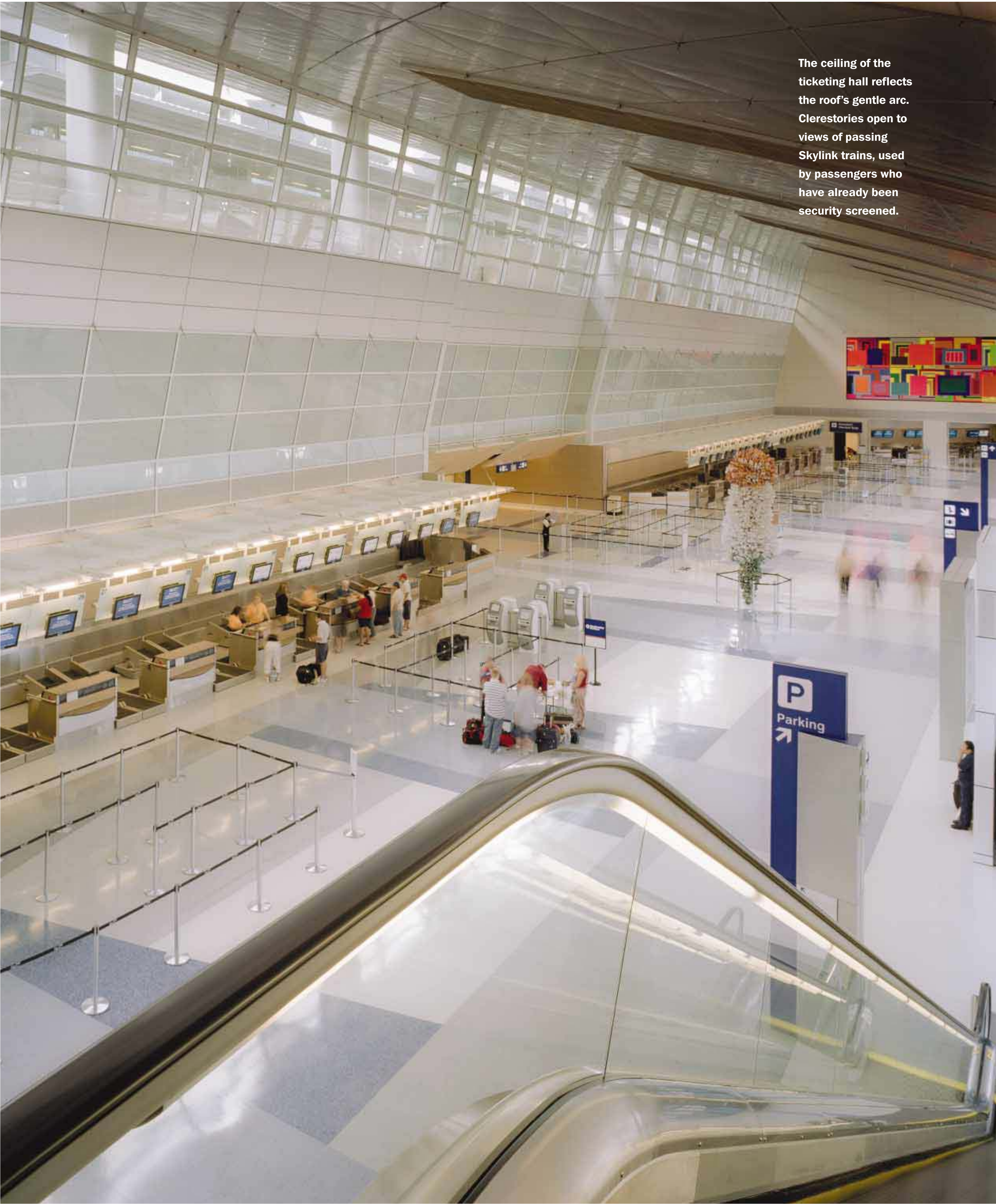
DEPARTURE LEVEL



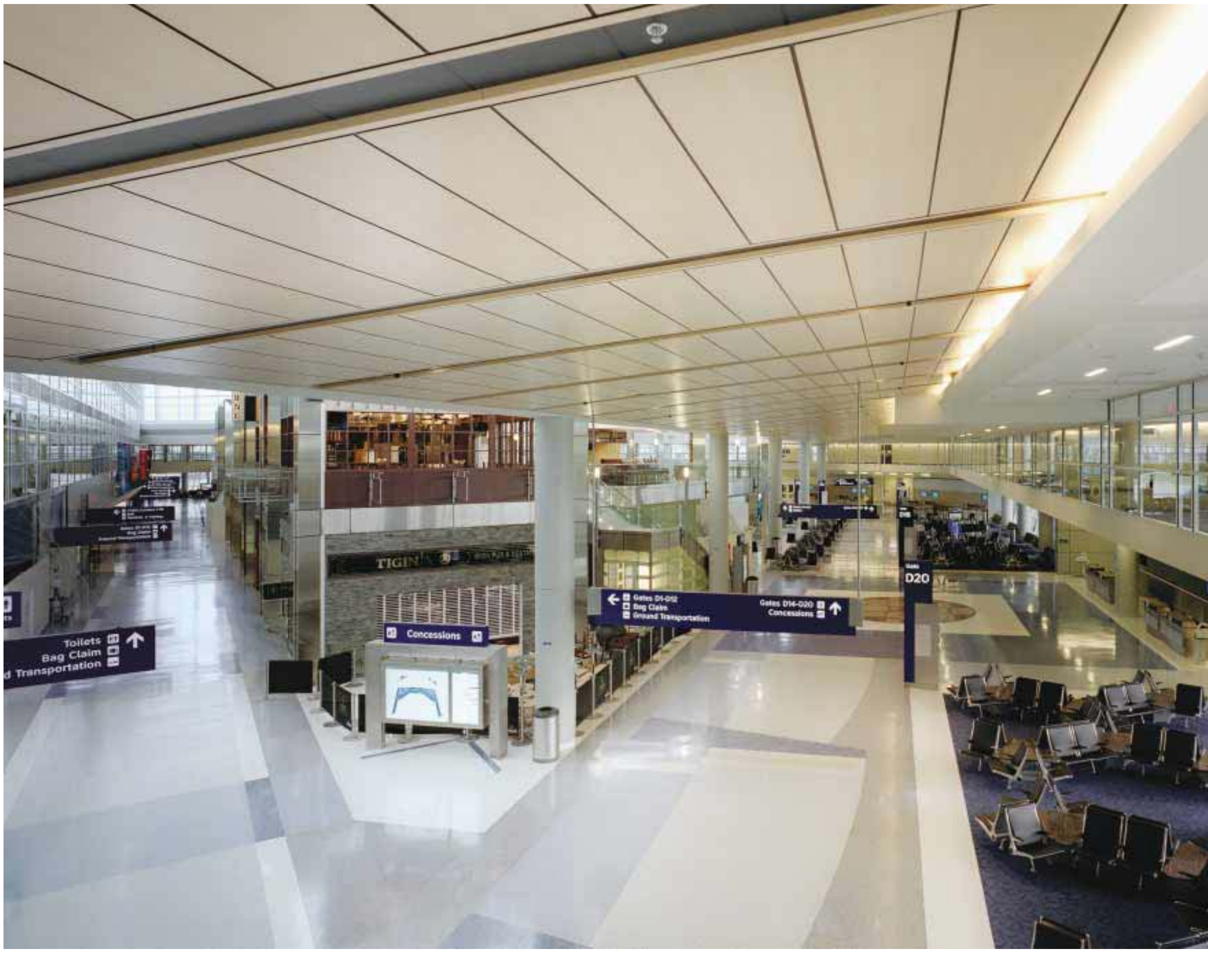
The ceiling of the ticketing hall reflects the roof's gentle arc. Clerestories open to views of passing Skylink trains, used by passengers who have already been security screened.

Commentary

According to Paslay, this unbelievably complex undertaking came in on time and under budget. It also came in underinspired. The decision to keep the new terminal largely within an envelope defined by a 1974 program half as large results in a very densely packed structure, with long treks to some gates and disorienting changes of direction, especially for arriving passengers. The design has not coalesced into the memorable experience officials say they sought. DFW press information compares the roof profile to the wing of a stealth bomber, for example, but it has far too many tacked-on shapes to make more than an ambivalent statement. At the curbside, the roof ends in thick, abrupt steps, a clumsiness imposed by budget constraints. The roof also got thicker when 2,500 tons of structural steel were added to prevent collapse in the event a vehicle bomb managed to detonate within one of the ticketing halls. Keeping a vehicle out of the building seems a far simpler solution.

The palette of standard commercial components isn't suited to such a large structure. The fingerprints of contractor-driven design-build are visible in such decisions. The gridded curtain wall that wraps airport and hotel alike is scaleless, making the structure look more impregnable than inviting. Only the fabric awning over the arrivals curb adds a welcome note of visual lift.

The concourses are generously scaled and well lit by clerestories—an improvement passengers will applaud. They'll appreciate escalators for arriving passengers at the gate and a parking-garage navigation system that directs passengers to available parking spaces. The art program offers the humane welcome and sense of place that the architecture doesn't quite deliver. With airport hubs a key to economic growth in a global age, it's too bad Dallas/Fort Worth missed its opportunity to match today's international standard in airport design. ■



Canted wood-paneled ceilings, a typical transition between major, high-ceilinged spaces, draw travelers into baggage claim (right).

Concourses feature two levels of daylit shops (above). A David Driskell mobile hangs in the hotel entry (below).

South Terminal Expansion
Seattle, Washington

4

NBBJ ADDED FAST-CHANGING SECURITY REQUIREMENTS ON THE FLY WHILE STAYING TRUE TO A SUCCESSFUL TERMINAL PROTOTYPE.

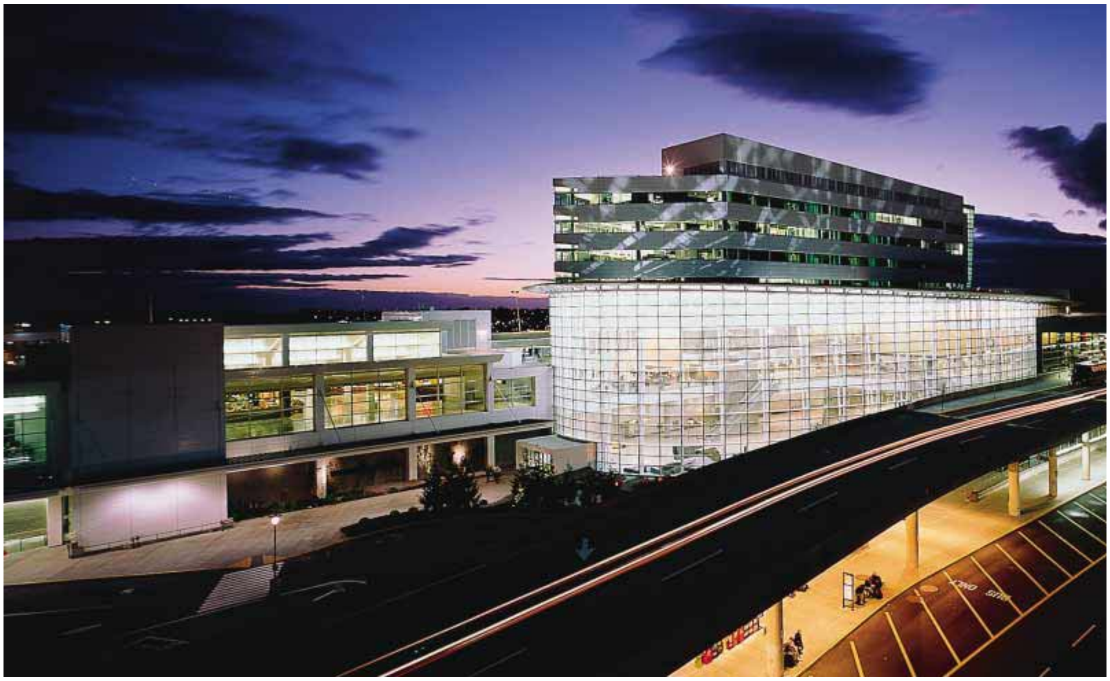
By John Pastier

Architect: *NBBJ—Keith Hui, James Jonassen, Ted McCagg, Mike Rehder, Rysia Suchecka, James Suehiro, Tim Weyand, Richard Zieve, Jeffrey Bailey, Andrew Bromberg*
Client: *Port of Seattle*
Consultants: *KPFF, Carla Keel Group (structural engineering); Wood Harbinger, CDi (mechanical, electrical); Magnusson Klemencic (civil engineering); Murase Associates (landscaping)*
General contractor: *Clark Construction*

Size: *880,000 square feet, 14 gates total*
Cost: *$350 million*
Completion date: *2004*

Sources
Curtain wall: *Gardiner Metal Systems (framing); Viracon (glass)*
Metal panels: *Centria*
Skylights: *AWallS*
Ceiling panels: *Ceilings Plus*
Lighting: *Zumtobel; Ledalite; BK; Johnson Controls (controls)*

For more information on this project, go to Building Types Study at **www.archrecord.com**.



A 150-foot-tall tower housing 110,000 square feet of airport offices and an 8,000-square-foot conference center surmounts a glowing arrivals hall (below). Its elliptical form punctuates the southern end of Sea-Tac's landside terminal.

PHOTOGRAPHY: © CHRISTIAN RICHTERS

A dramatic 1972 reconfiguration of Seattle-Tacoma International Airport, or Sea-Tac, has proved remarkably adaptable over years of changing airline service and tightening security. Seattle-based architect NBBJ's task in adding to it was to stay true to what had worked while altering the design to incorporate fast-changing security requirements after 9/11.

The 1970s design, by the firm Richardson Associates (its successor firm folded a few years ago), made Sea-Tac an industry exemplar, integrating structured parking, clear and easy passenger and vehicular circulation, and the world's first airport subway linking the main and satellite terminals. It packaged this efficiency in a disciplined, understated Modernism that has worn well.

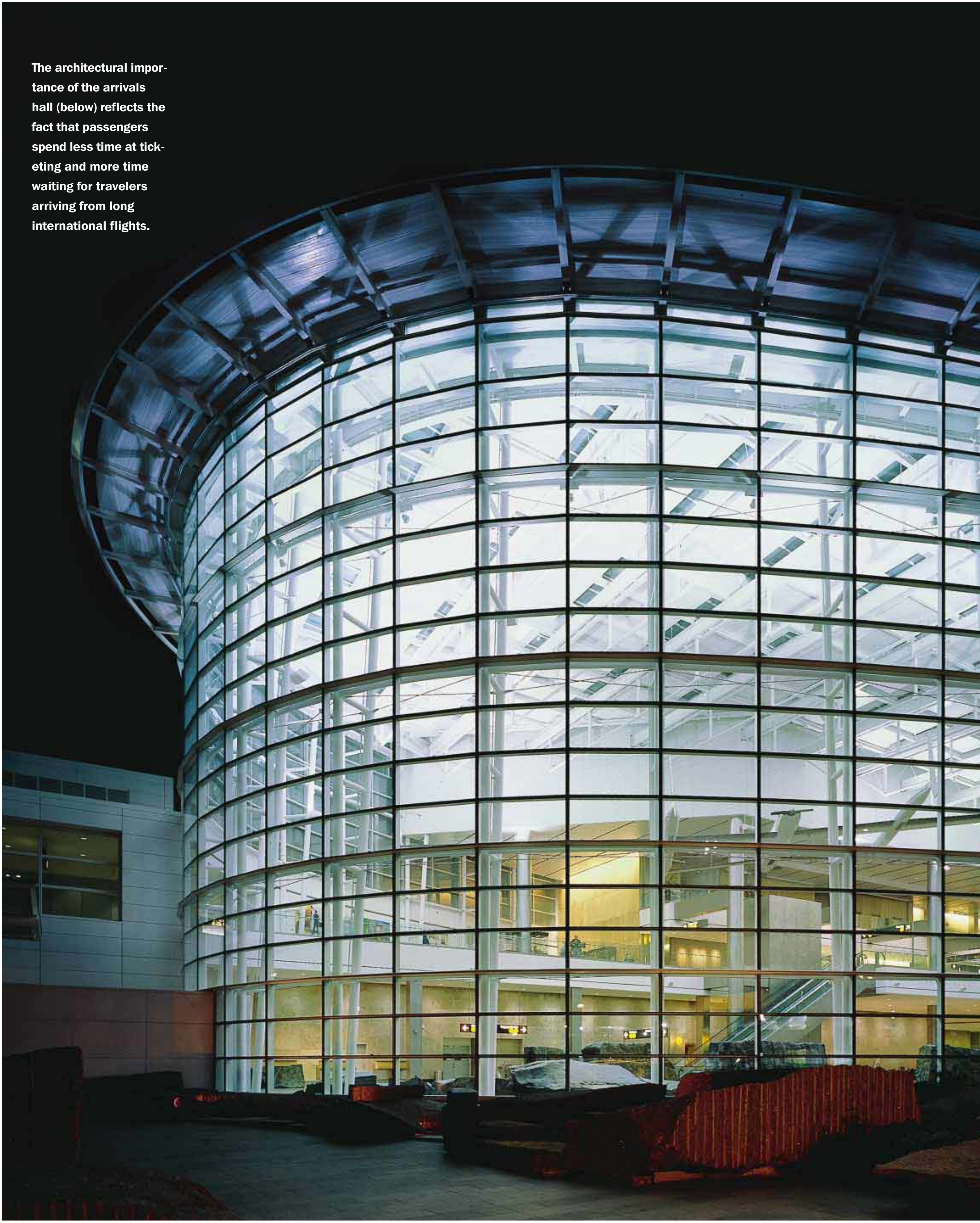
Two major alterations have opened in the past two years: a Central Terminal makeover [see coverage at www.archrecord.com] and NBBJ's South Terminal Expansion Project (STEP), a $587 million, mixed-use addition.

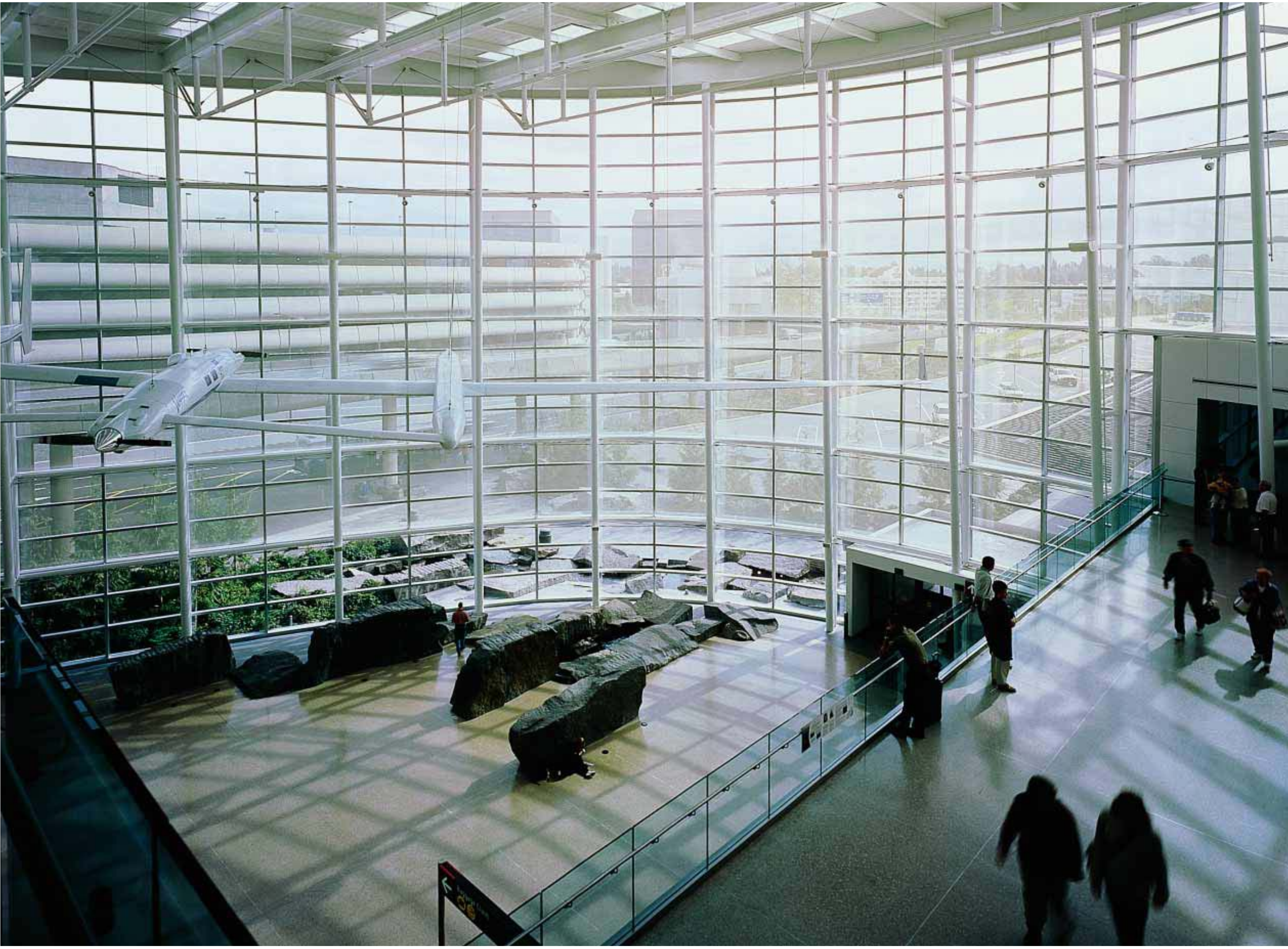
Program

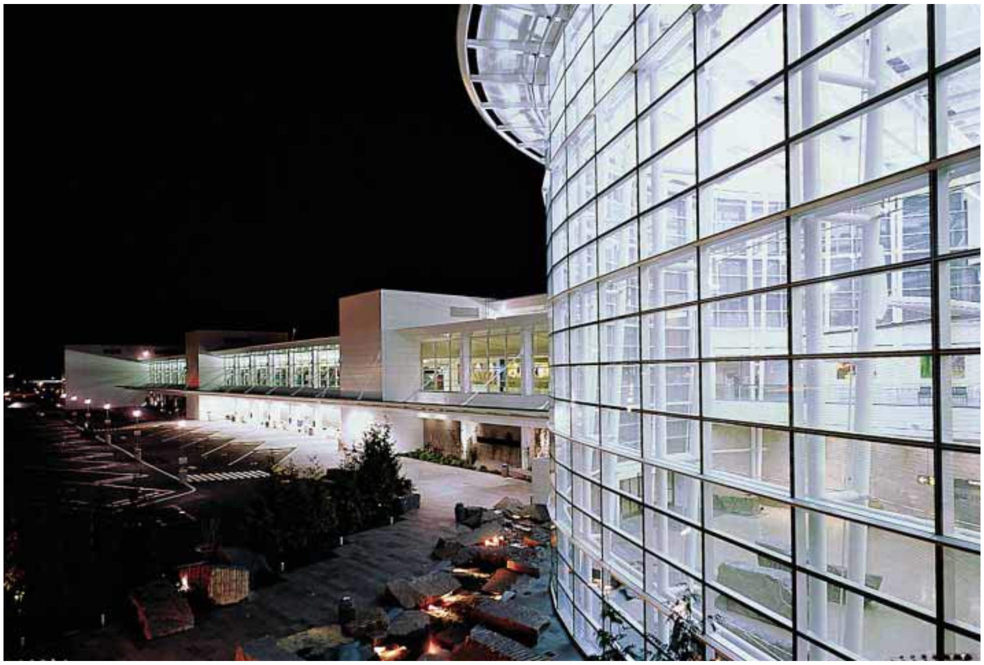
STEP's 2,100-foot-long, 762,000-square-foot terminal and finger concourse slips below a tower housing 110,000 square feet of airport offices and an 8,000-square-foot conference center. It adds seven new gates to seven replaced ones, accessed by Sea-Tac's first moving sidewalks. A generous arrivals hall was intended to offer a real welcome to passengers, especially international travelers. Included are technologically

John Pastier writes about architecture from Seattle.

The architectural importance of the arrivals hall (below) reflects the fact that passengers spend less time at ticketing and more time waiting for travelers arriving from long international flights.







Anchoring the new concourse (left), the arrivals hall is wrapped in a 70-foot-tall window wall braced by vertical trusses (above) reflecting strict seismic requirements. An indoor-outdoor rock-and-water landscape feature, designed by the late Robert Murase, straddles the arrivals-hall wall.

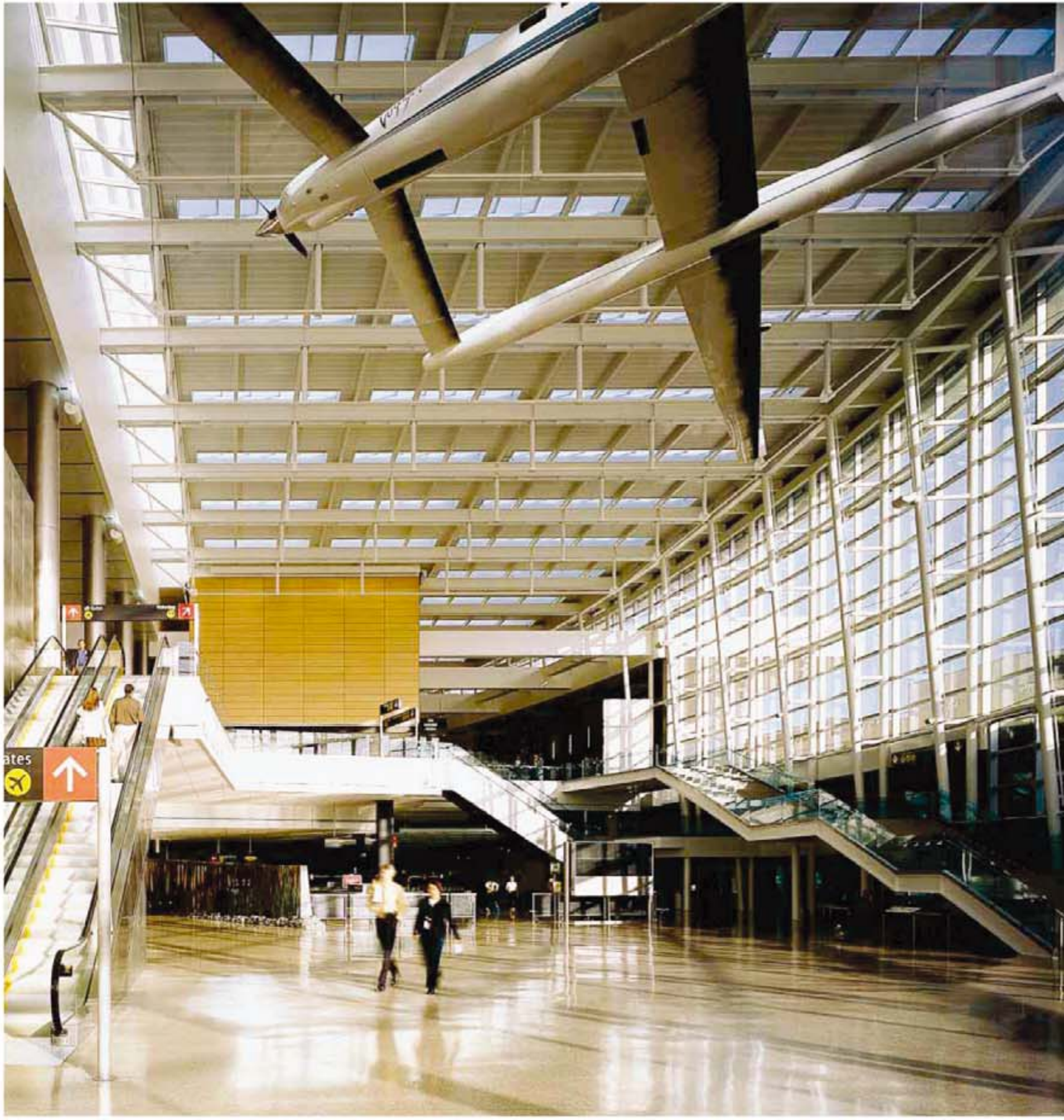
advanced baggage-screening devices that serve a third of the airport's needs, and other security installations growing out of 9/11.

Solution

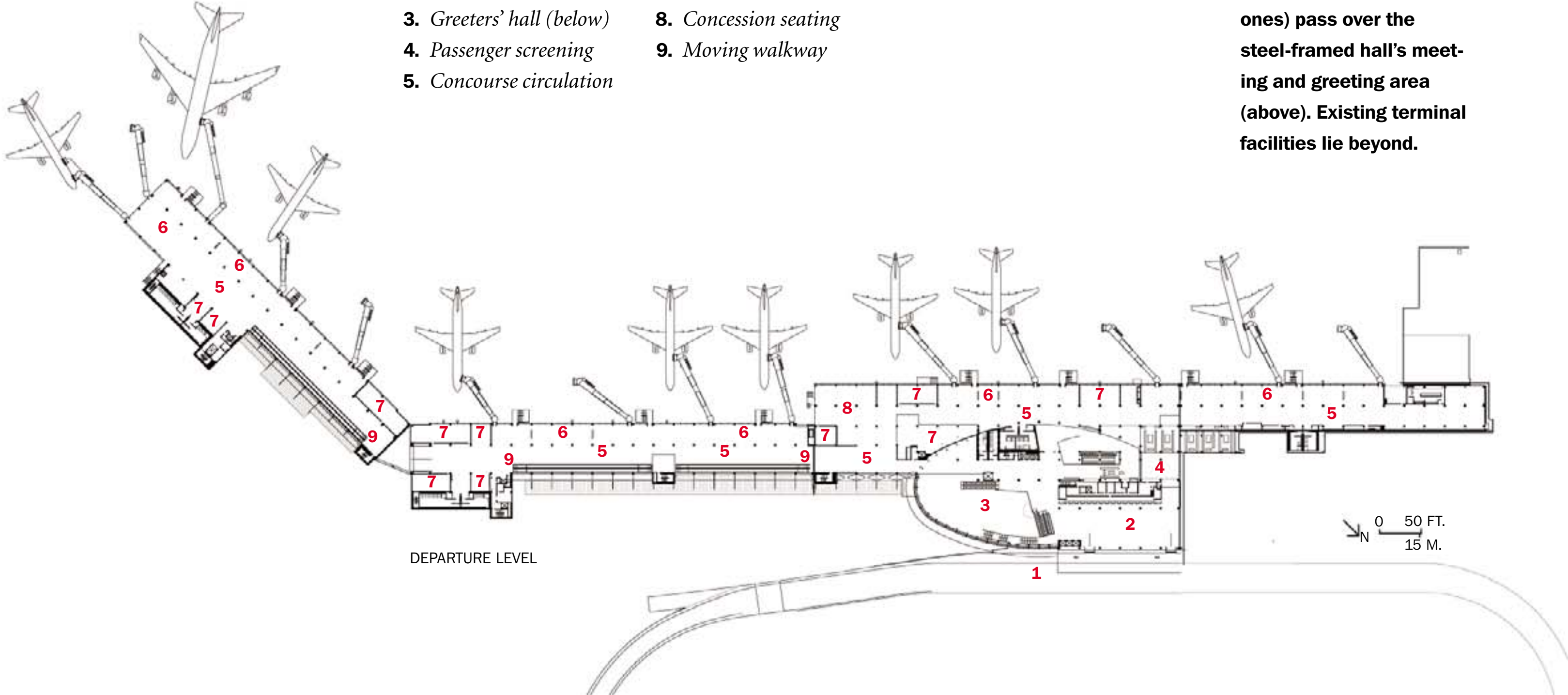
NBBJ wished to give STEP a Northwestern character without overt reference to common regional symbols: no salmon, Space Needles, or totem poles, other than those in the gift shops.

NBBJ's design opens panoramas of the Evergreen State's indigenous trees and nearby mountains—Mt. Rainier and the Cascade range. Outwardly canted glass walls open to sweeping airfield views.

STEP's design and construction was greatly complicated by the aftermath of 9/11. At that point, construction was about 25 percent complete, and the project had to be redesigned on the fly to accommodate a series of new security requirements. The arrivals hall can't be used as the international-arrivals nexus it was intended to be because the Transportation Security Administration deemed unacceptable a minimal cross traffic of arriving international travelers and cleared, departing domestic passengers. With $7 million in yet-to-be-funded alterations, international passengers will arrive at



Departing passengers (and arriving domestic ones) pass over the steel-framed hall's meeting and greeting area (above). Existing terminal facilities lie beyond.



1. *Departure roadway*
2. *Ticketing hall*
3. *Greeters' hall (below)*
4. *Passenger screening*
5. *Concourse circulation*
6. *Gate lounge*
7. *Concession*
8. *Concession seating*
9. *Moving walkway*

the South Terminal as originally planned, and the greeters' hall will fulfill its original intent.

Commentary

NBBJ has responded intelligently to the challenges of adding to Sea-Tac, albeit not with high drama, unfettered imagination, or structural pyrotechnics. The firm's measured response mirrors the famed Northwestern ethos of civility and understatement, and reminds us that despite outbreaks of Postmodernism and excessive woodsiness in local design, the region has had a healthy Modernist tradition since the Second World War.

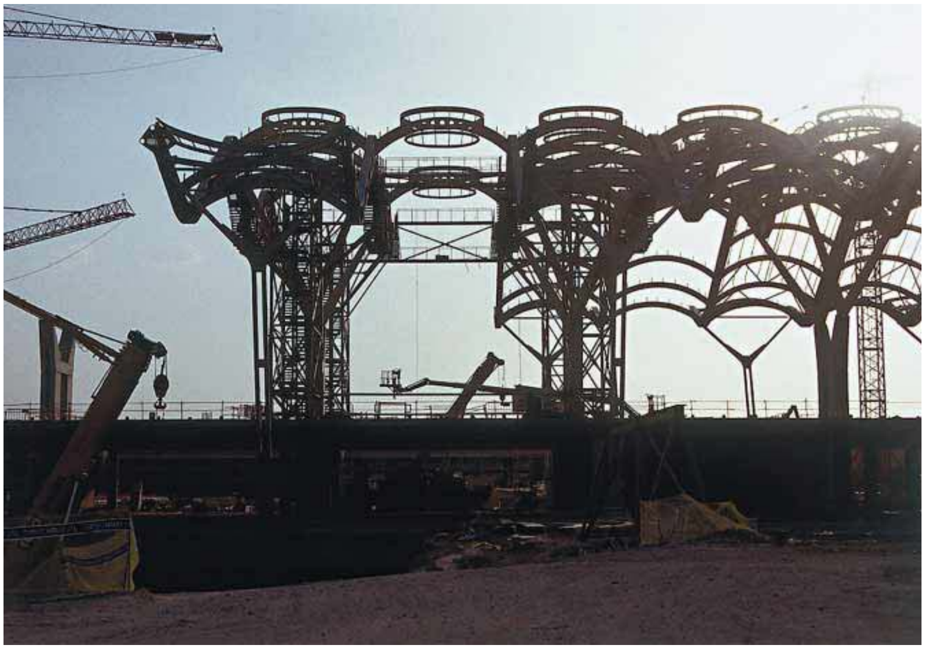
It is regrettable that the arrivals hall, deservedly offering a warm and spacious welcome to weary arriving passengers, can't yet be used as intended. What should be a bustling public place remains underpopulated for now, a daily reminder of the price imposed by tightened security. ■

The outwardly rising profile of the concourse's ceiling (below) suggests aerodynamic form, while high glass walls (above) capture the often-elusive light.

Flights of Fancy in Long-Span Design

NEW AIRPORT TERMINALS FEATURE BREATHTAKING ROOF STRUCTURES, WHICH SOLVE FUNCTIONAL CHALLENGES WHILE DELIGHTING HARRIED TRAVELERS.

By Nancy B. Solomon, AIA



At Terminal 4 at Barajas Airport in Madrid (above), designed by Richard Rogers and Estudio Lamela, the same long-span roof module was applied consistently to multiple segments.

PHOTOGRAPHY: COURTESY RICHARD ROGERS PARTNERSHIP

Over the years, airport design has become inextricably linked to crystal-clear wayfinding, expansive views, and abundant daylight. Nothing seems to satisfy—or express—these characteristics as elegantly and vividly as do long-span roofs. By minimizing the number of vertical supports and maximizing opportunities for skylights and other daylighting strategies, such vast structures permit passengers to see clearly where they have come from and where they are going. Meanwhile, the soaring volumes and undulating shapes made possible by their inherent geometries can help lift the spirits of most any weary traveler, even before leaving the ground.

While a roof is essentially the means to keep out the elements for most buildings, it is often the defining architectural feature of an airport terminal. "Airports require big-scale solutions," explains Adolfo Preus, an architect with the firm Studio Lamela in Madrid. A long-span roof can help facilitate the flow of circulation amid its complex internal programming; provide flexibility in an industry whose use patterns have been known to fluctuate relatively quickly in a short period of time; echo the large dimensions and aerodynamic shapes of a terminal's primary focal point—the aircraft; and generate the scale and excitement befitting the primary ports of entry into our cities and countries.

A long-span roof structure can typically be found in the terminal's departure hall. "Departure halls are treated as the prime space in the airport," observes Michael Meschino, senior associate in the Toronto office of the engineering firm Halcrow Yolles. "It's where our clients particularly want daylight, fine details, and grand dimensions." Passengers, after all, spend the most time in airports in preparation for a trip. Some terminals may capitalize on long-span structures in other sections as well. In the new terminal at Lester B. Pearson International Airport in Toronto, for example, the architects used a second long-span roof to cap the terminal's international hammerhead—the large element at the end of one of the piers dedicated as the waiting area for passengers going abroad. And at the new terminal for Barajas Airport in Madrid, the same long-span roof module was applied consistently to multiple segments.

Long-span roofs also raise other, nonstructural issues. The creation of such an expansive interior volume—most of which is far from the pedestrian level—raises the question of how to economically condition the space. Architects also have to consider maintenance requirements when deciding where and how to install mechanical, lighting, and communication systems within such large vertical dimensions.

Despite—or because of—all the possible variations and concerns in long-span roof structures, Steven Cook, AIA, principal architect at Murphy/Jahn, was able to express most succinctly the one

Nancy B. Solomon writes frequently about building science.

CONTINUING EDUCATION

Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. To receive credit, turn to page 188 and follow the instructions. Other opportunities to receive Continuing Education credits in this issue include these sponsored sections: "Designing with American Hardwoods," sponsored by The Hardwood Council, page 197, and "Fluid Applied Air/Moisture Barriers for Moisture Control and Mold Prevention in Wall Construction," sponsored by Sto, page 203.

LEARNING OBJECTIVES

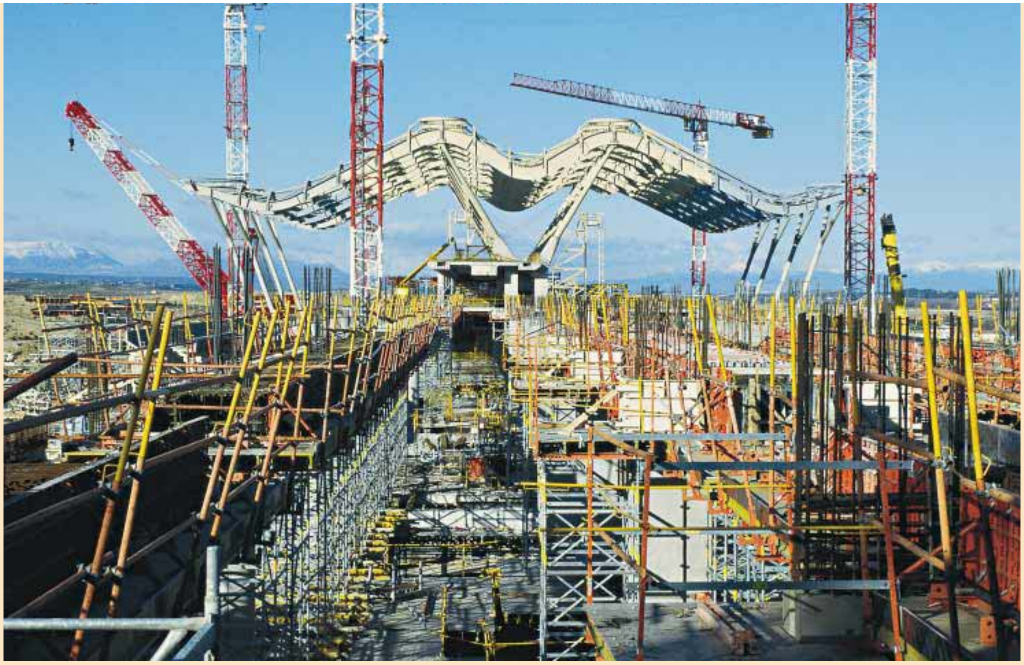
After reading this article, you should be able to:

1. Define the term "long-span roof."

2. Describe various types of long-span roof structures.

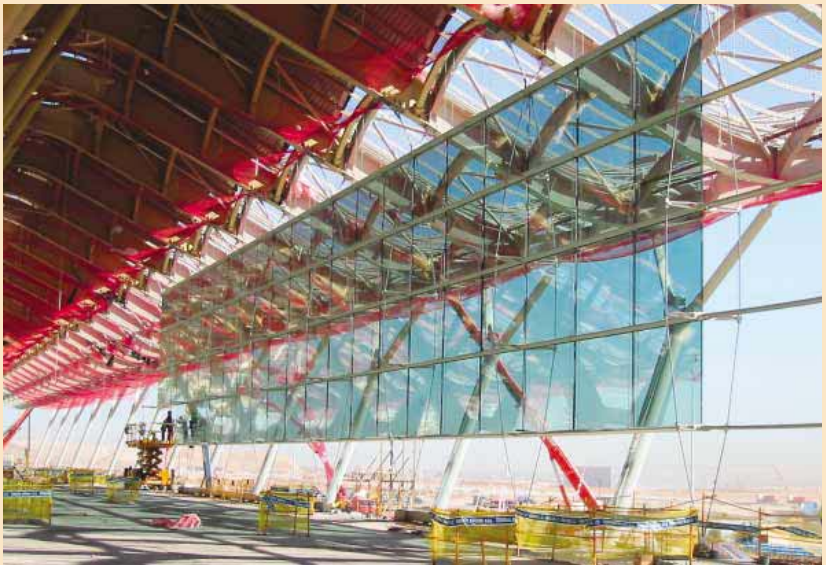
3. Discuss how long-span roofs are appropriate for airports.

For this story and more continuing education, as well as links to sources, white papers, and products, go to **www.archrecord.com**.



Terminal 4 at Barajas Airport, Madrid

Each of the terminal's 236-foot-long seagull-wing roof girders (left) is comprised of three sections that have been bolted together. Arched secondary members span girders spaced 30 feet apart (below). The arched components support purlins that run in the same direction as the girders and carry the roof deck and membrane. In order to accentuate the horizontal nature of the terminal, the architects designed a slender "cable kipper truss" to support horizontal mullions that can carry the glazing.



recommendation shared by all architects working in this specialty: "Make sure you have a good engineer."

Terminal 4 at Barajas Airport, Madrid

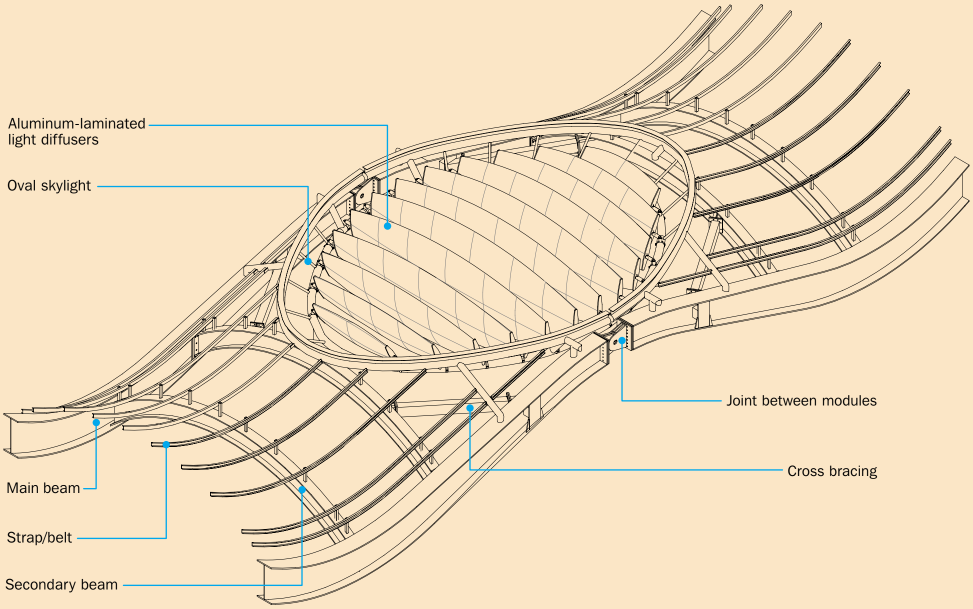
Like waves in the ocean, the undulating roof form atop the new Terminal 4 at Madrid's Barajas Airport (see page 150) seems capable of going on for as long as the eye can see. And perhaps one day it will. Dating back to 1933, the Barajas Airport has been expanded several times, and the likelihood is great that future expansions will be necessary. The most recent addition for the Spanish National Airports Authority (AENA) was undertaken collaboratively by two architectural practices—Richard Rogers Partnership of London and Studio Lamela of Madrid—and two engineering firms—TPS in Croydon, U.K., and INITEC in Madrid. The design's straightforward linear organization and flexible kit of parts, expressed so clearly by its eye-catching roof, offers AENA the possibility of relatively quickly and easily adding on in most any direction in the years to come.

The new terminal is broken into four discrete horizontal bars that run parallel to each other: The first is an open canopy over the roadway; the next two form the main building for ticketing, security, baggage claim, and boarding areas for both national and Schengen flights (the latter are between countries in the Economic European Community that do not require passport control); and the fourth, and longest, is the satellite building that serves primarily international travel but can accommodate a mix of flight types if required. An underground train links the satellite to the main building. The same curvilinear roof module ripples across all four bars.

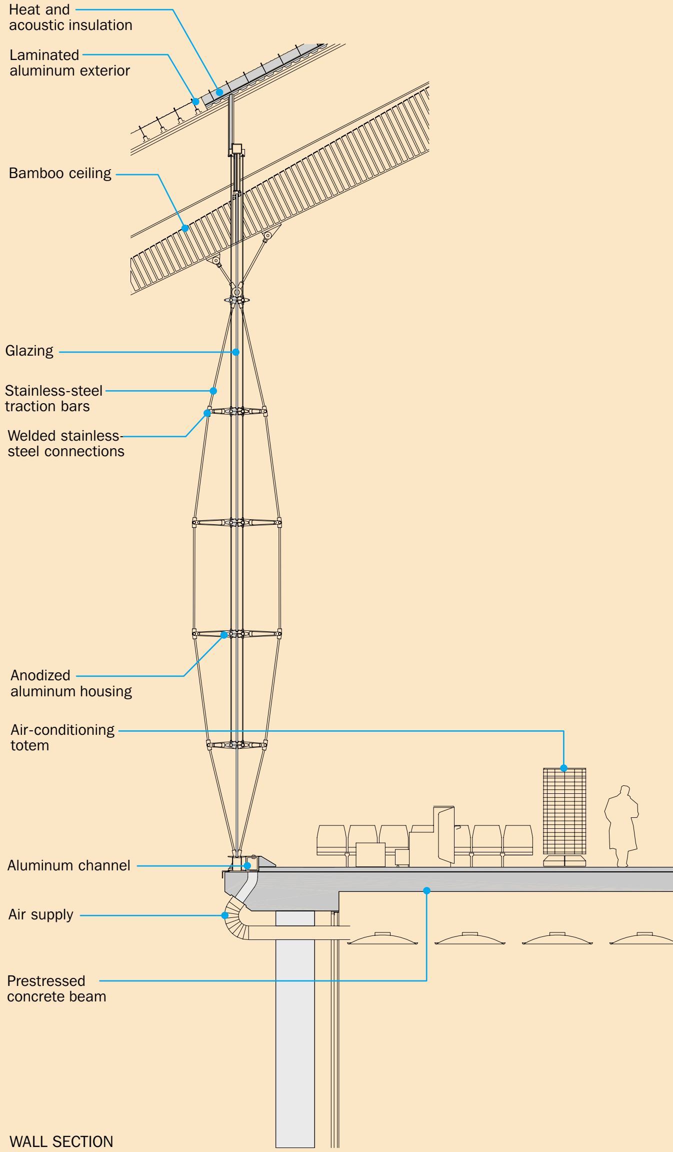
In cross section, the bars that form the enclosed buildings are constructed in three layers: a three-story concrete basement, a three-story concrete frame above grade, and the steel-framed roof. Longitudinally, each bar consists of a basic bay, about 30 feet wide, which is repeated as often as needed to create the necessary length. Expansion joints were inserted every eight bays to accommodate the wide swings in temperature expected at the roof plane.

The seagull-wing roof profile emerged early in the design. Recalls Carlos Lamela, executive president of Studio Lamela, "We were convinced from the beginning that we had to create a large container that would allow as much flexibility as possible, and we felt that we needed to cover the building with a very light structure that could provide the impression of grace and elegance." The roof's structural design was the responsibility of the architects, with technical assistance provided by TPS's subconsultants SKM Anthony Hunts of London.

PHOTOGRAPHY: COURTESY RICHARD ROGERS PARTNERSHIP (THIS SPREAD)


Aluminum-laminated light diffusers
Oval skylight
Joint between modules
Cross bracing
Main beam
Strap/belt
Secondary beam

ROOF DIAGRAM


Heat and acoustic insulation
Laminated aluminum exterior
Bamboo ceiling
Glazing
Stainless-steel traction bars
Welded stainless-steel connections
Anodized aluminum housing
Air-conditioning totem
Aluminum channel
Air supply
Prestressed concrete beam

WALL SECTION

Fabricated from steel plates, the primary roof girders consist of three separate elements—a central "double-S bend" and two tapered outer sections. Once bolted together, a single girder measures 236 feet in length and ranges in depth from 59 inches at the center to 30 inches at each tip. The girders run parallel to each, approximately 30 feet on center.

A pair of girders is supported at the center of their spans by four tapered steel branches bolted to a concrete column and by one Y-shaped element on either end. The roof structure was erected in segments. On the ground, the contractor assembled two double-S bend sections with the requisite perpendicular secondary members and two circular skylight frames to create the central module. This was then lifted onto and connected to the four branches of the center column. Subsequently, two tapered outer sections and their secondary members were assembled to form an end module. This too was lifted into place above the Y-shaped column and bolted to the central module. The process was repeated for the other end module, at which point the structure for a full module—with two full-length girders—was in place.

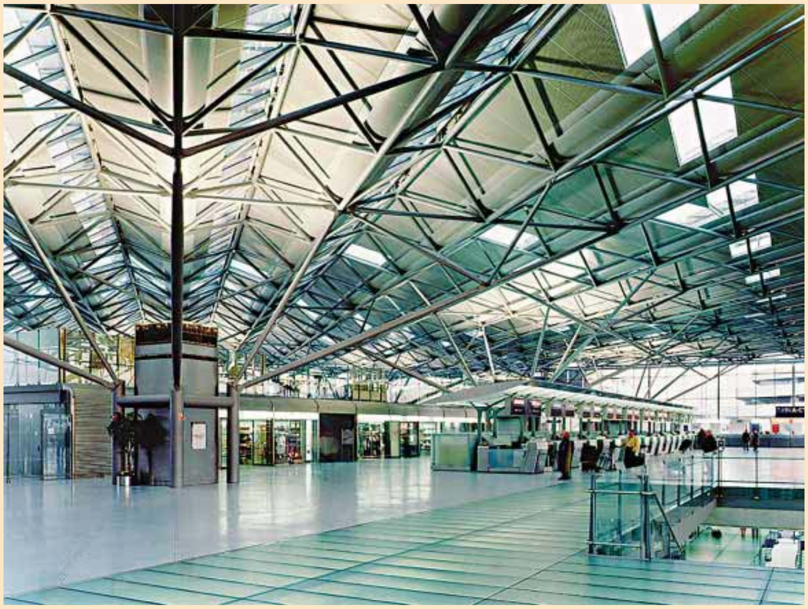
An adjacent structural module would similarly be erected on a central column approximately 60 feet from the first. The space defined by the girders of the two adjacent modules would also be filled in with secondary roof members and skylight framing, thereby creating yet another bay of the same dimension.

The architects wanted the horizontality of the terminal's linear scheme to visually dominate the design. To accomplish this, they had to carefully consider the architectural and structural relationships between roof and elevation. The practitioners, for example, extended the roof significantly beyond the glazed facade. Moreover, they introduced what came to be called "cable kipper trusses" to avoid heavy vertical support members within the glazing system. Installed every 30 feet, these elegant vertical components support horizontal mullions, which in turn carry the high-performance glass.

The cable trusses are held in tension by the steel roof above and the concrete floor below. In essence, explains Les Postawa, technical director at SKM Anthony Hunts, "The roof holds up the wall." During assembly of the roof, the contractor used provisional jacks to induce a temporary tensile load. Once the kipper trusses were installed, the jacks were gradually released and removed.

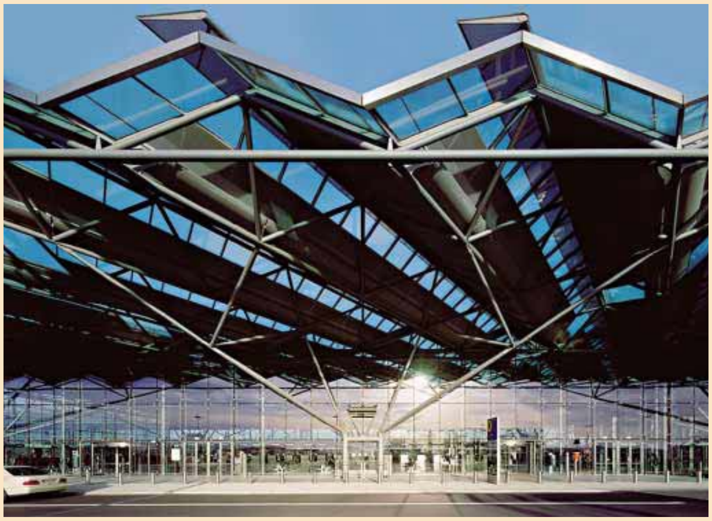
Lester B. Pearson International Airport

Toronto's Pearson Airport dates back to the 1950s, when the first of what were to be three round terminals was constructed. The circular parti—in which passengers drove in at the bottom, parked at the top, and accessed



Cologne/Bonn Airport, Cologne/Bonn

The building consists of a structural module of 70-by-70-foot steel trees supporting a continuously folded roof plate with north-facing skylights. The roof consists of panels, so-called cells, which are placed onto the folded plate with simple bolted connections and waterproof joint seals. The cells are designed to fulfill various functions, such as light transmission, weather barrier, exterior heat absorption, interior heat absorption.



PHOTOGRAPHY: © H.G. ESCH

planes along the circumference—became outmoded as soon as wide-body aircraft were introduced, so the other two cylindrical terminals were never built. By the 1960s, a cargo facility was remodeled to serve as a second terminal, although offering little in the way of amenities. In the 1980s, yet another terminal was constructed.

By the mid-1990s, the Greater Toronto Airports Authority (GTAA) subsequently engaged NAPA, an airport planning firm in Toronto, to develop a master plan. Completed in 1997, it proposed that, over time, the first two terminals should be demolished and a new, continuous facility constructed—all while the airport remained operational.

To undertake this mammoth endeavor, GTAA engaged Airport Architects Canada, which is a joint venture formed by three firms: Skidmore, Owings & Merrill International (SOM), Adamson Associates Architects, and Moshe Safdie Associates Architects.

Laura Ettelman, AIA, an associate partner at SOM and project manager for Airport Architects Canada, explains that the effort is being implemented in three stages: The first stage of the new terminal was completed in 2004; the second stage is scheduled to open in 2007; and the third stage is expected to be finished by 2012.

The New York office of Arup led the schematic design and design-development phases of the structural design for stage 1, which includes the central processor—the main portion of the terminal that contains functions such as ticketing, baggage claim, and security. The Toronto office of Halcrow Yolles is the engineer of record for the entire terminal building, in addition to undertaking schematic design and design development for stage 2.

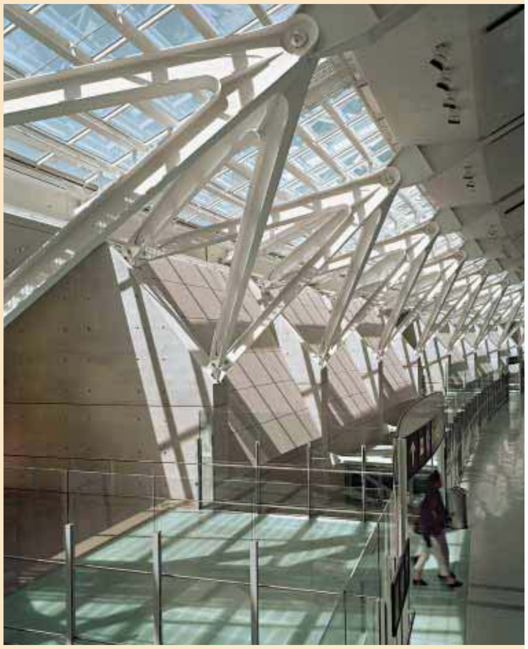
The new terminal consists of a large, curved section that the designers refer to as the "high-roof" area of the central processor, a lower and narrower zone called the "liner area" of the central processor, and several piers that extend perpendicularly from the liner area. Each pier ends in a large waiting area known in aviation parlance as a "hammerhead." The groundside of the terminal faces north; airside is south. Once completed, the central processor will measure roughly 1,000 feet from end to end.

As its name implies, the high-roof area features an arched roof that spans about 230 feet over the departure hall. "The design direction from the client—including unobstructed views of the airport and to the airfield—made long-span the logical choice," explains Ettelman. The developer wanted the building to be "intuitive" to the passengers, with abundant visual connection.

The arch construction allows the roof to span a longer space than would have been possible if the girders were flat. To capitalize on this "arch action," explains Mike Meschino, senior associate of Halcrow

Lester B. Pearson International Airport, Toronto

Arriving passengers approach the main terminal through double-height concourses lit by clerestories and skylights. The new terminal consists of a large, curved section that the designers refer to as the "high-roof" area of the central processor, a lower and narrower zone area called the "liner area" of the central processor, and several piers that extend perpendicularly from the liner area.



PHOTOGRAPHY: COURTESY SOM

Yolles, the designers had to achieve a height-to-span ratio of at least 1:8. The final design came in only slightly above this minimum requirement, at about 1:9. "The architects wanted as flat a curve as possible while keeping a thin profile," recalls Meschino. He explains that, had they gone much flatter, they would have had to switch to a 20-foot-deep truss system. In contrast, the depth of the wide-flange plate girders that create the arches is only 55 inches.

Forty-three arches are positioned 2.25 degrees apart in a radial pattern. This translates into a distance of about 25 feet on center along the north wall and 33 feet on center along the south wall. Although they are structurally monolithic, the 217-foot girders had to be erected in two pieces and then connected, either by welding where the splice is exposed to view or bolted where it is hidden behind ceiling finishes.

The girders transfer their loads on both the north and south sides via pin connections. On the north side, each arch is supported by a frame consisting of two 100-foot-tall architecturally exposed structural-steel-tube columns braced with one diagonal and one horizontal tie, both fabricated from built-up plates. Horizontal wide-flange beams running perpendicular to the frames at floor level give lateral stability in this direction. Diagonal steel tubes within the concentric plane created by the outer row of columns provide additional bracing between the frames.

Cologne/Bonn Airport

By the early 1990s, the number of passengers coming through the lone terminal at Germany's Cologne/Bonn Airport had far exceeded its design capacity of 3 million per year. In response, the airport authority organized a design competition to start working on a second building that would greatly expand upon the first. Murphy/Jahn of Chicago was selected as the architect for the overall project, which—in addition to the new terminal—included an underground rail station, two parking garages, and a two-level roadway. Three structural engineering firms contributed to the terminal itself: The local firm of IGH handled the concrete work; Werner Sobek of Stuttgart, Germany, addressed the glass facade; and Arup's New York office was responsible for the long-span roof. The new facility was completed in 2000.

The first and second terminals are a study in contrasts. Terminal 1 was designed in the 1960s—before wide-body jets became commonplace and heightened concerns for security necessitated a greater degree of centralization, notes Steven Cook, AIA, principal architect at Murphy/Jahn. The older terminal is U-shaped and constructed of concrete. The new terminal is linear to better accommodate the larger aircraft and to establish maximum clarity for both departing and arriving passengers. Although supported by a concrete base, its upper levels sparkle with prefabricated steel and glass.

The 743,000-square-foot Terminal 2, which has increased the airport's total passenger capacity to 7.5 million per year, is organized vertically: A portion of the underground train station occupies the lowest two levels; the arrivals hall is located on level three; baggage handling, plus some retail and connections to parking, can be found on level four; and the departure hall sits on top at level 5.

The long-span roof hovers about 30 feet above the floor of the departure hall. It is a folded plate made from multiple trusses oriented in an inclined position. Trusses share either a top or bottom chord. The horizontal structural lid rests on 22 treelike columns spaced 100 feet on center. While the geometries of the column grid and building shell relate to existing site-plan features, the primary axis of the roof trusses was rotated about 45-degrees in deference to the sun. Sloped, north-facing roof surfaces are sheathed with glazed panels to welcome abundant diffused daylight into the hall below. The roof cantilevers 50 feet over the roadway elevation to provide some weather protection along this edge. The plate tilts up about 5 degrees at this point so that it will appear flat to the eye—a technique that Helmut Jahn learned years ago when working on the McCormick Center in Chicago, says Cook.

The base of each support structure consists of four vertical tubes positioned in a square formation and braced horizontally near their tops by another set of tubes. Each side of the square measures about 8 feet across. All vertical tubes terminate about 8.5 feet above the departure hall floor on Level 5. Those along the roadway facade, however, start at a lower level, so their vertical components rise to 43 feet.

More slender, tapered branches extend diagonally from the tops of the vertical elements to the roof above, at which point they engage the lower chords of the trusses with 2-inch-thick steel plates and pin connections. The greatest distance between the uppermost ends of a structural canopy emanating from a single support column is 105 feet. The designers specified seamless tubes of cast steel for both roof and column members to achieve a structural system that is both highly efficient and visually elegant.

Fresh air is supplied, and return air pulled in, through ducts that are integrated within the base of these open-framed supports, and additional fan-coil units are installed at the building perimeter. Only the pedestrian level of the expansive departure hall is conditioned, assuring passenger comfort while minimizing energy consumption. Rather than installing communication and lighting systems from the ceiling far above, the architects also relied on the column assemblies to serve as platforms for such technologies. This took a lot of coordination among the various disciplines, recalls Cook, but was necessary to ensure that the equipment would be in easy reach for ongoing maintenance and repairs.

According to Cook, one of the most challenging aspects of this roof design was its lack of expansion joints. Normally, a span of this magnitude would have such details to accommodate the movement caused by inevitable changes in temperature. But the architects wanted the top covering of this terminal to appear as a continuous plane—an expression that could not be achieved if it had to be interrupted periodically by joints. Instead, explains Raymond Crane, principal of Arup's Boston office, the engineers used computer modeling to analyze the forces that would be exerted due to thermal expansion and treated them as if they were yet another type of load that had to be handled by the structural design. ■

AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

INSTRUCTIONS

- **Read the article "Flights of Fancy in Long-Span Design" using the learning objectives provided.**
- **Complete the questions below, then fill in your answers (page 262).**
- **Fill out and submit the AIA/CES education reporting form (page 262) or download the form at www.archrecord.com to receive one AIA learning unit.**

QUESTIONS

1. A long-span roof can help do all but which?
  a. generate excitement
  b. facilitate circulation
  c. provide flexibility
  d. air-condition economically

2. A long-span roof is characterized by which?
  a. an extremely wide distance between vertical supports
  b. an extremely long roof from one end to the other
  c. a long distance between terminal and departure hall
  d. an extremely thick truss profile

3. Departure halls are where clients want all elements except which?
  a. daylight
  b. fine details
  c. close parking
  d. grand dimension

4. The hammerhead area of an airport is where?
  a. the large element at the end of a pier
  b. the distance between terminals
  c. the part that echoes the aerodynamic shape of the aircraft
  d. the port of entry for international travelers

5. Airport terminals previously designed as rounded shapes could not accommodate which?
  a. increasing number of passengers
  b. larger aircraft
  c. more parking
  d. larger amounts of luggage

6. The Barajas Airport was designed to provide all except which?
  a. the impression of grace and elegance
  b. mingling of Schengen and international passengers
  c. a large container
  d. as much flexibility as possible

7. Pearson International Airport is planning to do which?
  a. add two more round terminals
  b. add onto the existing round terminal
  c. demolish the round terminal and add onto the other terminal
  d. demolish the two existing terminals and build a new facility

8. A long-span roof was used for the Pearson Airport because the client wanted which?
  a. unobstructed views of the airport
  b. a design with deep arches
  c. cable kipper trusses
  d. horizontality to be the predominant aesthetic

9. To achieve as long a span as possible in the Pearson Airport, which structural design was used?
  a. 20-foot-deep trusses
  b. 1:20 ratio arched girders
  c. flat girders
  d. 1:9 ratio arched girders

10. Which airport has a folded-plate roof oriented in an inclined position?
  a. Pearson International
  b. Barajas Madrid
  c. Cologne/Bonn
  d. all of the above

Damaged buildings and widespread environmental hazards remain in Katrina's aftermath

At press time in mid-September, the U.S. Army Corps of Engineers (USACE) had drained nearly 90 percent of the brackish, oily, bacteria-laden floodwaters that have inundated low-lying areas of New Orleans following Hurricane Katrina. Various federal, state, and local government agencies, assisted by private contractors and nonprofit groups, were scrambling to get drinking-water and wastewater treatment systems up and running. Once the city is drained of the deluge, it will face the arduous task of assessing the condition of thousands of damaged buildings as well as an environmental and public-health disaster of immense proportions.

The process of totaling up structural losses is only beginning. A full accounting will take several months, and detrimental effects to water quality and other local environmental and ecological conditions will surely be felt for years to come. (For continuing coverage, visit the Hurricane Recovery Information Center at www.construction.com.)

Extraordinary circumstances

Many structures that sustain water damage after a flood can be repaired and occupied again, but then this was no ordinary flood. The sheer volume of water, the number of days structures have been inundated, and contaminants in the water itself make it unlikely that any structures in the hardest-hit areas will survive (see main news story, page 42). In some areas in St. Bernard's Parish, where flooding was particularly severe, a greasy film of oil coats houses and streets from an 819,000-gallon petroleum spill that occurred in Meraux, Louisiana, where a storage tank owned by Murphy Oil Corporation was lifted from its foundation. The spill was one of several in the region.

Among those buildings with only partial damage, exterior structures and interior materials will need to be inspected. Timber-framed structures warp and weaken when they get waterlogged, although they can sometimes resume their original shapes once dry. Mortar in brick structures and chimneys can dissolve when submerged, causing not only potential weaknesses and failures but also the possibility of carbon monoxide leaking from fireplace flues if they are used again. Wall systems composed of plywood, drywall, and insulation soak up moisture and lose strength and load-bearing capacity when wet. Floodwaters also corrode wiring and disrupt gas and utility lines and plumbing and septic systems. Furniture, light fixtures, ductwork, and appliances will be clogged with dirt and debris.

But mold and contamination might end up being the bigger problems in New Orleans, whose warm, humid climate provides a perfect breeding ground for mold even in the absence of flooding. Mold uses materials like wet gypsum and insulation as food sources, say experts. Damp conditions also cause bacteria, dust mites, and other unsavory microorganisms to thrive indoors. Mud and contaminants will foul interiors, along with solvents, glues, and particulate matter that can leach from building materials and furniture when they are saturated for a long period of time.

Experts agree that even if structures survive, many of their interiors would need to be gutted and replaced—which in many cases will prove costlier than demolition. The National Trust for Historic Preservation, the AIA, and others are working to ensure that landmark and historic structures are spared this fate.

Water quality plummets

Meanwhile, the USACE has had no choice but to pump the untreated floodwaters back into the confines of Lake Pontchartrain, whose levees were breached in five places in the aftermath of the floods. The other alternative was to pump the water directly into the Mississippi River—an even less appealing option because the river is the drinking-water source for area residents, and putting floodwaters into it would

St. Bernard's Parish was one of the hardest hit by the floods following Hurricane Katrina. Hundreds of thousands of homes in the area have been lost.

PHOTOGRAPHY: © MICHAEL GOODMAN PHOTOGRAPHY

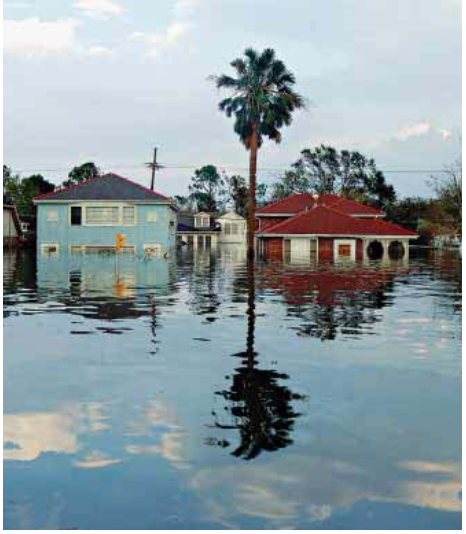
cause pollution to disperse even more widely throughout the region, according to the Environmental Protection Agency (EPA) and the Louisiana Department of Environmental Quality (LaDEQ).

EVEN IF STRUCTURES SURVIVE THE FLOOD, THEIR INTERIORS WILL NEED TO BE GUTTED ENTIRELY IN MOST CASES.

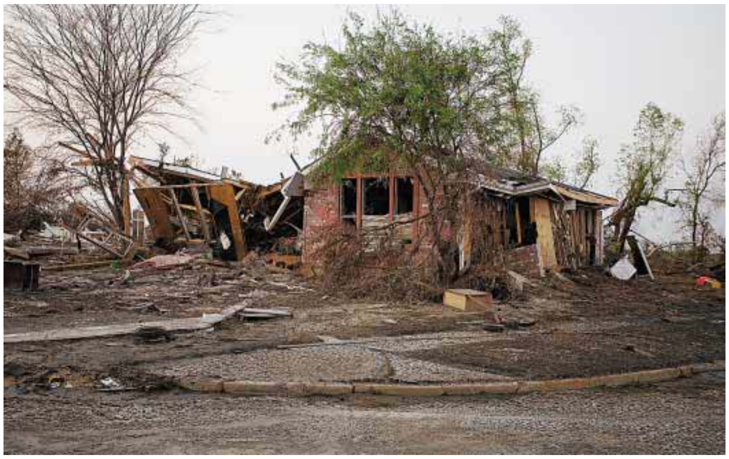
The floodwater isn't so much water as a putrid, black-green brew of decomposing remains, human waste, raw sewage, oil, gasoline, pesticides being sprayed to keep mosquitoes at bay, and a cocktail of pathogens and chemicals never intended for human consumption.

On September 3, EPA and LaDEQ tested the floodwaters in the city of New Orleans and found levels of coliform bacteria that were more than 10 times higher than the limit that would cause a recreational water body to be closed down. Elevated concentrations of lead and other metals were also found during testing. Three Superfund sites in the New Orleans area were also flooded: the Agriculture Street Landfill in New Orleans, where city residents dumped their trash for decades; the Bayou Bonfouca site in Slidell, Louisiana, and the Madisonville Creosote works. Environmental agencies don't know yet how much or what types of contamination may have been released from these sites, but they stress that waterborne pathogens pose a greater immediate health threat.

EPA and the Centers for Disease Control have formed a joint task force with state and local agen-



Houses flooded nearly to their roofs will be targeted for demolition in St. Bernard's Parish (left). One house barely stands erect after floodwaters were drained from the neighborhood (below).



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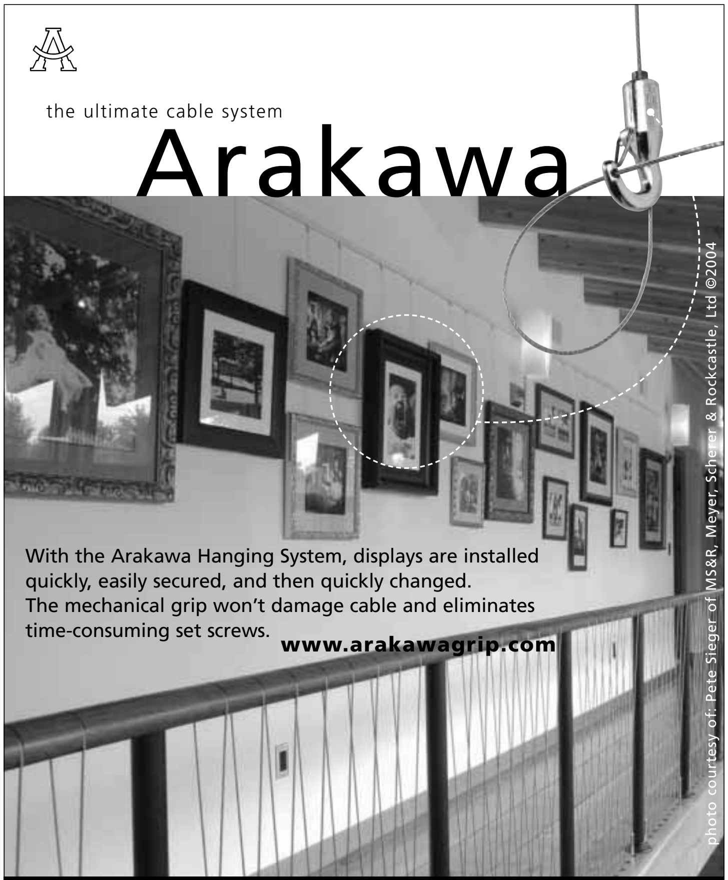

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cies to assess water quality and environmental conditions in the region on a continual basis, including sampling of waters from a wider area than was covered by the first round of tests, which were confined to floodwaters within city limits. Although water-quality officials have repeatedly cautioned residents and recovery workers not to drink or make contact with the floodwater, and have been issuing vaccines against waterborne diseases, they have declined to call it "toxic" despite the fact that many of the chemicals and pollutants present in the water are classified as such.

THE WIDESPREAD POLLUTION CAUSED BY THE FLOODS ARE STRAINING AN ALREADY FRAGILE ECOSYSTEM.

A fragile system

Lake Pontchartrain, a shallow tidal estuary covering 630 square miles immediately north of New Orleans, is an important economic engine for the region and provides essential habitat for a variety of endangered and protected fauna and flora. The pollution problem will have repercussions there over a long time. Decomposing organic matter like raw sewage depletes dissolved oxygen from the water, which can kill off plants and aquatic life. Bacteria and contaminants taint the oysters, shrimp, and other seafood for which the region is prized. The lake itself will be closed to boating and recreation for the foreseeable future, and oyster and seafood harvesting beds in the entire region have also closed indefinitely, with devastating economic consequences to the area's $2.7 billion fishing industry, which supplies 30 percent of the seafood consumed in the U.S.

The floodwaters inundated many wastewater treatment plants in and around New Orleans, making the safeguarding of water quality even more difficult.

PHOTOGRAPHY: © MICHAEL GOODMAN PHOTOGRAPHY

The floods underscored the ecological sensitivity of an area that's had its share of problems. About 1.5 million residents live around Lake Pontchartrain, making it the most densely populated area of Louisiana. But overdevelopment and human activities such as oil drilling are responsible for the area's loss of more than 50 percent of its wetland habitat since 1900, says the U.S. Geological Survey. Effluent from wastewater treatment plants degraded water quality for many years, causing intermittent closings of the lake to fishers and swimmers. Though recent treatment-plant upgrades had improved the region's ecological health over the past few years, the floods essentially wiped out those gains.

Cleaning up the Big Easy will prove anything but.

Deborah Snoonian, P.E.

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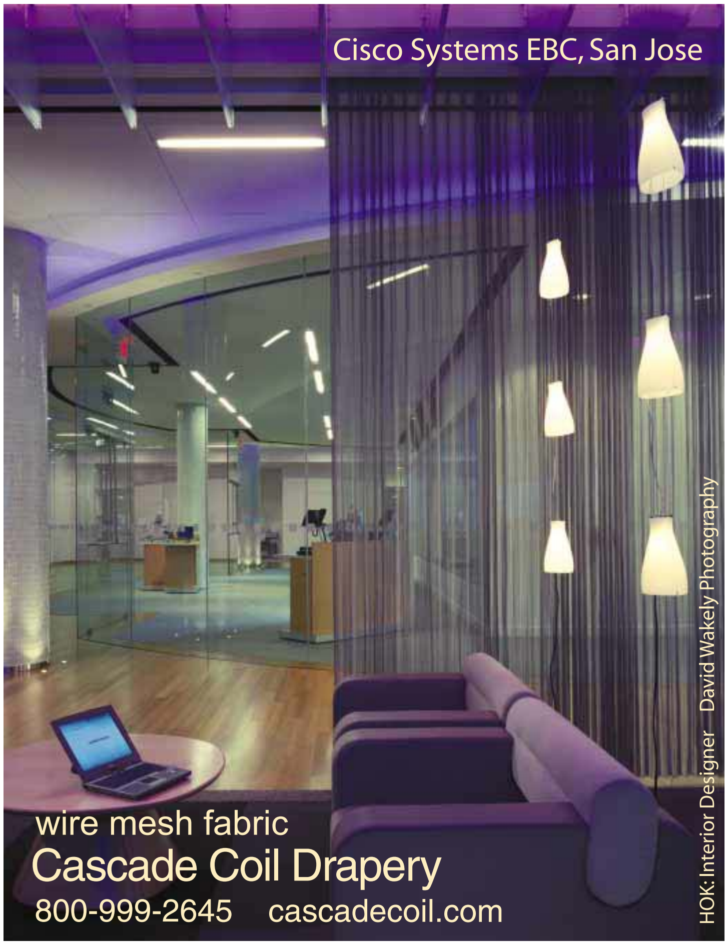

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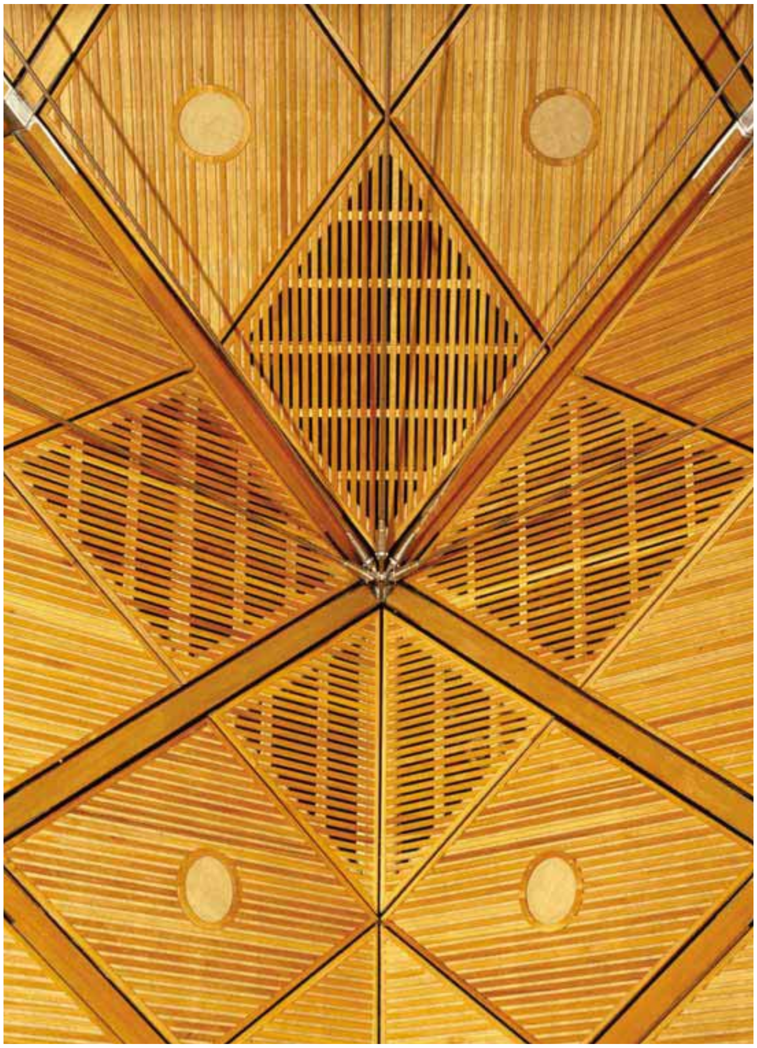
Designing with American Hardwoods: A Sustainable, Versatile Material Choice



Haberdasher's Hall, London, uses American white oak to blend traditional materials and building techniques in a 21st century venue. Architect: Michael Hopkins and Partners. Client: Haberdasher's Company.

CONTINUING EDUCATION

Use the learning objectives below to focus your study as you read **Designing with American Hardwoods: A Sustainable, Versatile Material Choice.** To earn one AIA/CES Learning Unit, including one hour of health, safety, welfare credit, answer the questions on page 201, then follow the reporting instructions on page 264, or go to the Continuing Education section on *archrecord.construction.com* and follow the reporting instructions.

LEARNING OBJECTIVES

After reading this article, you should be able to:

- Explore environmentally preferable uses of American hardwoods.
- Specify and use American hardwoods more effectively and sustainably.
- Understand how life cycle thinking facilitates green building products assessment.

Versatile, durable and sustainable, American hardwoods have served builders, architects, cabinetmakers and homeowners for centuries. Nontoxic, natural hardwoods bring desirable physical properties, eco-effectiveness and a warm aesthetic to floors, furniture, cabinetry and architectural millwork. Architects and designers often specify American hardwoods because they embody sustainability better than many exotic woods, or newly synthesized materials meant to imitate them.

American hardwoods have long been valued for their warm-toned aesthetics and utility, applicable in residential, commercial, educational, healthcare and institutional settings. Yet, sustainability concerns cause some architects to question traditional assumptions about natural materials. Design professionals recognize that natural materials enrich the built environment and enhance design projects. However, the impulse to protect natural resources may make some architects hesitant to specify them.

As green design evolves into a standard requirement, the process of selecting and specifying materials and products has become increasingly demanding. The meanings of "sustainable" and "environmentally preferable" are not always crystal clear.

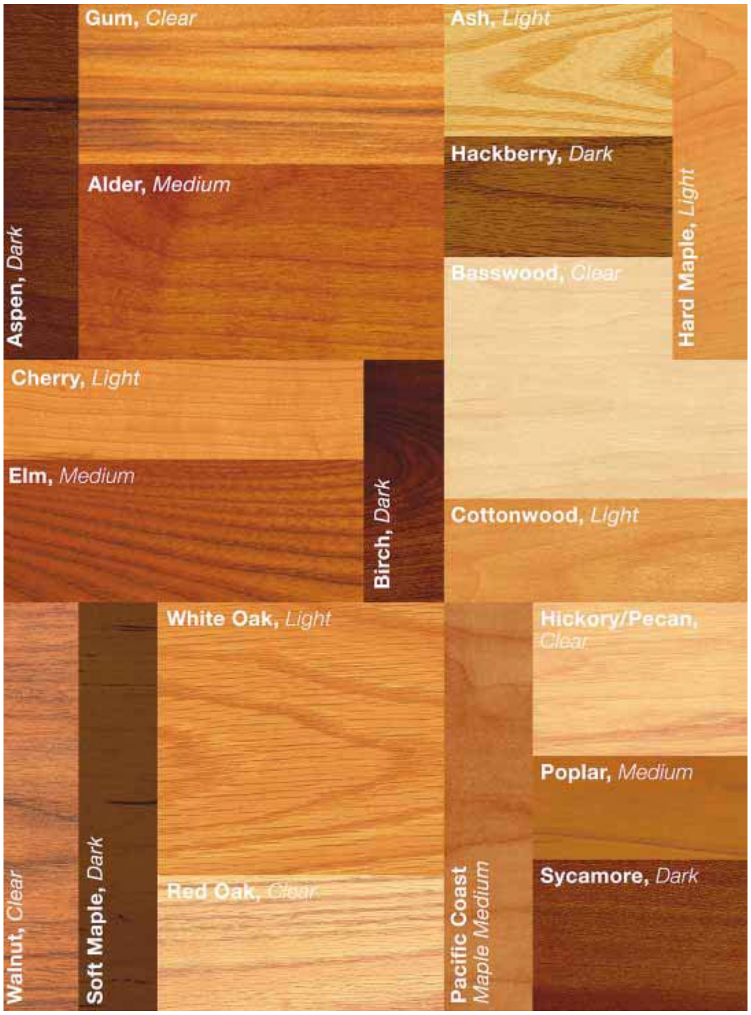
Many building products and materials bear "sustainable" labels from across the globe, but this has only clouded the issue. Some products are less green than they claim, while some manufacturers use an "environmentally preferable" label based on only one positive attribute. Exaggerated, misleading or false marketing claims are common hazards when reviewing green products.

Caution is essential in assessing the multitude of low-cost, globally sourced products, synthetic and exotic materials, and related environmental concerns. Available information is often imperfect and incomplete. Trade-offs are inevitable and choices often are not obvious. Selecting and specifying green materials and products requires research and understanding of all product design criteria.

American hardwoods are renewable, sustainable resources that do not introduce toxins or unrecyclable materials into the built environment or the waste stream. Nonetheless, some architects who want to use them still may question their suitability in green buildings. For reassurance, design professionals often turn to product certification systems, because they represent a third-party corroboration of sustainability claims.

However, certification systems have sharp limits. "Certification" and "sustainability" are not necessarily synonymous or interchangeable terms. Decision-making tools such as Leadership in Energy and Environmental Design (LEED) and life cycle analysis (LCA) are evolving, but sustainability can be quantified and standardized only to a limited degree. Green material selection and specification decisions require research and a thorough understanding of materials and processes, rather than reliance on any single resource or reference guide for comparing green materials, products and properties.

Selecting the most environmentally preferable combination of material and application remains a challenge, even given the breadth of knowledge and information that most architects command. Life cycle choices should be based upon a complete understanding of



materials, rather than on a certification seal or a standards rating alone. Nonetheless, when the unique qualities of American hardwoods make sense for a project, there are practical tactics for specifying and applying them sustainably. Life cycle thinking can logically determine where American hardwoods are environmentally preferable, and how they can be used most eco-effectively.

This article reviews the subtlety and diversity that underline a familiar range of materials, the hardwoods of North America. It explores innovative and sustainable applications of American hardwoods, and offers practical approaches to help architects make aesthetic and environmentally preferable choices.

WHAT "HARDWOOD" MEANS

For effective specifying decisions, design professionals must understand what hardwoods are, and how to compare them with alternative natural and manufactured materials. The term "hardwood" applies to angiosperms, which are trees with leaves, rather than needles. Hardwoods produce fruits or nuts in the summer, shed their leaves in the fall, and go dormant in the winter. The hundreds of hardwoods growing in the continental U.S. all are temperate species. American forests have more diversity of hardwood species than any other temperate forest in the world. They include: Alder, Ash, Aspen, Basswood, Beech, Birch, Cherry, Cottonwood, Elm, Gum, Hackberry, Hard Maple, Hickory/Pecan, Pacific Coast Maple, Poplar, Red Oak, Sassafras, Soft Maple, Sycamore, Walnut, White Oak and Willow.

All of the hardwoods listed are commercially available and can be used for cabinets, furniture, moldings and other architectural millwork, based on aesthetics and supply. For reasons of fashion, regional accessibility, convention, or lack of awareness, many hardwoods, such as gum, poplar and soft maple often are unexplored. Others, including ash, hickory and oak, frequently are underused, despite their widespread commercial availability.

(For detailed profiles of each species, a comparison of physical and working properties, and design values for selected species, see the *Hardwood Species Guide* at www.americanhardwoods.org. Design values for the oaks, maples, beech, birch, hickory, aspen, cottonwood and poplar cover applications such as posts and timbers, beams and stringers, and dimensional lumber two- to four-inches-thick by two- or more -inches-wide.)

Architects and designers have long understood that people respond positively to natural materials in the built environment. Hardwoods add warmth and character, and contribute healthful non-allergenic qualities to homes and workplaces. Since American hardwoods exhibit especially rich diversity in color and grain, they're most often specified where visual appeal and durability are important. Protective finishes enhance the wood's color, texture and grain pattern, and are non-toxic and durable. As a result, hardwood products are a sustainable option, even in areas with heavy wear and stringent care, cleaning and maintenance requirements, such as healthcare settings.

Hardwoods contrast with the "softwoods," or gymnosperms, which are cone-bearing trees with needles, including the fir, pine, hemlock and spruce most often used in construction. Generally, hardwoods are denser and harder than softwoods, although actual resistance to pressure and wear in both groups varies by species.

For this reason, not every American hardwood is suitable for flooring. Those that are hard enough have performed well for centuries. Most applications do not require the extreme hardness exhibited by the tropical woods and grasses, even in heavy traffic areas.

Regarding tropical hardwoods, many of the hardwood species that grow in the world's tropical forests are subjects of special concern because of illegal, unsustainable harvesting and its effects on wild habitats. In contrast, the U.S. Forest Service documents the sustainability of North American hardwoods, where more has grown than has been harvested annually for more than 50 years. *(Figure 1)* In addition, hardwood harvesting in U.S. forests is subject to federal, state and local laws and regulations that protect water and wildlife.

In an interview appearing in the 2005 white paper series, *Material Matters*, available at www.americanhardwoods.org under "Green Design and Building," materials scientist Andrew Dent, director of library and materials research at Material ConneXion, New York, NY, addresses the synthetic substitutes meant to imitate American hardwoods. "The whole point of a composite is putting two dissimilar materials together... basically the perfect composite material is wood. It has the right combination of strengthening fibers and gluey binders to put it all together. So wonderfully reusable and so wonderfully sustainable. Unfortunately the thing they try to replace it with is probably one of the least sustainable materials you're ever going to come across," he says.

Design Alliance Architects

Floors of locally sourced white oak work sustainably and efficiently with a geothermal radiant heat system at the Girl Scouts' Eberly Family Learning Center in West Virginia.

WORKING WITH NATURE, INNOVATIVELY

Design professionals should know how to judge the sustainability of American hardwoods compared to other materials. When hardwoods are selected for a project, their natural properties and variations distinguish them from predictable, mass-produced materials. Architects who understand these natural processes and manufacturing methods often discover aesthetic and economic opportunities in the choices of species and lumber grades. Three green design principles can be helpful.

- *Work with nature in every respect.*
- *Juxtapose hardwoods with other materials.*
- *Accommodate hardwoods' natural properties during design and specifications.*

Work with nature in every respect. Hardwood-savvy architects understand that some species are more abundant than others. As climate and soil vary, each combination of growing conditions favors a different palette of species. This holds true for various forests and regions across the U.S. Hackberry grows in Louisiana, for example, but not in Vermont; hard maple thrives in Wisconsin, but not in Georgia. This affects the commercial availability and relative affordability of each species. Making the most of this diversity, many architects first consider all the hardwoods native to a region before settling on a solution.

According to Chris Klehm, LEED AP, president of Clearview Construction Services in Pittsburgh, hardwood flooring was used for the 14,200-square-foot Eberly Family Learning Center at the Girl Scouts of Southwestern Pennsylvania's Camp Roy Weller, in Bruceton Mills, WV, where he was the general contractor. "Local West Virginia white oak was selected because it's durable," he says.

This hardwood choice also works effectively with the building's radiant heating system and its heat source, an energy-efficient geothermal system. The client, Denise Fowler of the Girl Scouts, says, "The Girl Scouts are extremely happy with the hardwood flooring over radiant heat. We have three geothermal boilers that make for efficient temperature control. This method significantly lowers our heating costs and promotes sustainability to our youth at the same time."

Klehm adds, "There are two reasons why I select hardwoods. First, they support the sustainable forestry efforts of farmers, as well as the process of creating oxygen for the atmosphere naturally, and second, they are beautiful. Few other products create value and beauty through the aging process."

Juxtapose with other materials. Peter Bohlin, FAIA, president of Bohlin Cywinski Jackson, Wilkes-Barre, PA, frequently juxtaposes multiple hardwood species, staining techniques, and contrasting materials. In a 2004 interview appearing in *Material Matters*, Bohlin says, "We've been using hardwoods for windows, particularly where we're wrapping [window frames] with copper." For the design and construction of a Utah mountain residence, he notes, "We've used maple or cherry for the basic wood frame that's visible on the inside, and a copper sheathing on the outside. Where we're at high altitudes... that is quite a sustainable strategy. Obviously, there's interplay between [the materials], but also it is really taking the same attitude to all of them, of going after those almost inevitable extensions of those materials and their natures... sort of expressing the spirit of the particular material."

London's Haberdashers' Hall, completed in 2002 and designed by Sir Michael Hopkins, of London-based Michael Hopkins and Partners, combines modern architecture with traditional materials and building skills to form a 21st century high-quality venue. Hopkins, who with his wife and partner, Patty Hopkins, won the 1994 Royal Institute of British Architects Royal Gold Medal, is known for his innovative approaches to construction and energy-efficient design. For Haberdasher's Hall, he chose stainless steel ties, rather than timber trusses, as bracing elements for the roof clad in American white oak. At each intersection of the lattice, four stainless steel shoes are glued to the wood, and bolted to a stainless steel node connecting to steel ties that brace the structure. The result is a light, open, elegant and unobstructed wood pattern.

Accommodate natural properties. Even when applications are innovative, hardwoods are far from experimental materials. They exhibit characteristic and predictable behavior in any application. All wood will reach equilibrium with its surroundings, as the internal moisture content, usually ranging from six to eight percent, adapts to the ambient relative humidity. Traditional techniques address this slight expansion and contraction when installing trim, molding, millwork, flooring or built-ins. On the job site, materials should be kept dry and indoors several days before installation, after the space is climate-controlled. This allows the wood to adjust to relative humidity levels.

Aldo Leopold was a powerful 20th century advocate for conservation and "intelligent consumption." In an article in *American Forest* magazine, "The Home Builder Conserves," he questioned "our universal insistence on clear hardwoods for furniture and interior woodwork.... Consider that the greater part of our enormous hardwood waste occurs in the process of trimming out knots. Is it too much to hope that fashion may some day lift the ban against them?"

Little has changed since Leopold made his plea in 1928. Hardwoods with character markings usually are seen only in rustic settings. The clear high-grade wood that makes up only a small part of the tree is the norm for flooring and architectural millwork in commercial or residential applications. Sustainable use of more of each tree remains a design challenge.

Few design professionals take advantage of the full range of natural visual effects possible with hardwoods.

LEED AND CERTIFICATION SYSTEMS

Even with a strong grounding in the properties and origins of materials, architects may refer to certification systems, rating standards and assessment techniques in evaluating products and materials. However, these tools may be incomplete.

The U.S. Green Building Council's LEED guidelines are an evolving effort to set common standards of green measurement in areas as diverse as water efficiency, energy and atmosphere impact, material and resource use, and indoor environmental quality.

Although not intended as a product evaluation tool, LEED standards favor Forest Stewardship Council (FSC) certification for wood products despite the extremely limited availability of FSC-approved hardwoods anywhere in the world, including the U.S.

Ideally, certification offers reassurance that a product has some level of sustainable merit. However, certifications can become outdated as forest products, conditions and practices change, and not all that's sustainable is certified. Conversely, many forests and forest products meet certification standards even though they have not gone through the formal process.

American hardwood sources are a case in point. Private individuals and families own three quarters of U.S. hardwood forests. According to the U.S. Forest Service, their record of sustainable management spans more than 50 years. However, most do not participate in the fee-based, third-party certification programs established in the 1990s. In fact, less than five percent of the hardwood forestland in the U.S. is certified under any system, including FSC, the Sustainable Forestry Initiative (SFI), and the American Tree Farm program.

As a result, although architects will find sustainable locally-sourced hardwoods, most of the material will not be certified. While all LEED guidelines are being revisited, the FSC preference is unlikely to change soon. Similarly, without a realistic approach to complex hardwood supply chain and chain-of-custody issues, the U.S. hardwood certification situation is unlikely to change dramatically.

American Hardwood Sustainability

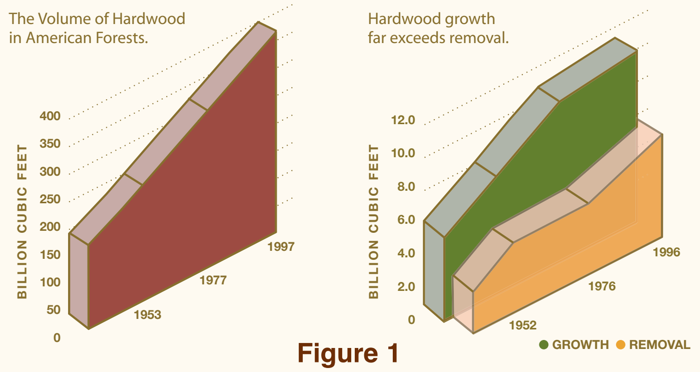


Figure 1

As products proliferate and China and South Asia dominate manufacturing, the variables in assessment detail become increasingly cumbersome. An increasing number of products and materials will be difficult to handle with traditional evaluation tools.

According to Dent, "We're still lacking the fundamental knowledge. We're lacking the terms, and also the 'realistics.' There are some great ideas about using recycled and sustainable materials, but you've got to get a healthy dose of realism there as well."

Jill Kowalski, AIA, LEED AP, director of sustainable design at Philadelphia-based EwingCole, says there's a problem when worldwide product sourcing meets the detailed demands of life cycle analysis. In a 2005 *Material Matters* interview, she observes, "When you're comparing systems, it's more straight-forward. But when you start applying it to products and materials, where there are parts and pieces from all over the globe, it's complicated. The question becomes, 'How far back do I take it?'" In most cases, taking it all the way back is impossible.

THE PRACTICALITIES OF LIFE CYCLE THINKING

Comparing two potential material alternatives, and defending the choice, means evaluating widely different characteristics. Sustainability concerns range from energy conservation, recycling and indoor air quality, to impact on indigenous peoples and wildlife habitats. Simple formulas are no help in weighing the positive impact of high-recycled content against the negative impact of high-embodied energy, for example.

New products are not always better when evaluating hardwoods and green building products. In a 2004 *Material Matters* interview, Huston Eubank, AIA, vice president of the World Green Building Council observes, "How about looking at old materials and finding new ways to use them? Let's look at some old solutions before we feel the need to invent some piece of rocket science that takes the entire power output of the Columbia River to manufacture."

Many forests and forest products meet certification standards even though they have not gone through the formal process.

Clearly, life cycle questions have no simple answers. There's no substitute for product and material research, professional judgment, critical thinking and common sense.

Rules of thumb, however, can produce defensibly sustainable decisions. Although full-scale life cycle analyses and assessments may be unrealistic, life cycle thinking is a practical route to materials selection—a common-sense framework for evaluating alternatives that can be tailored to each project.

Design professionals often use LEED as a quick checklist, and can be tempted to focus on amassing LEED points, rather than on integrated design. Kowalski notes, "If you get too hung up in the credits, you don't take advantage of the whole system. That's how LEED is meant to be used. If you're not used to integrated design, you may work line-by-line instead of big-picture. You have to put the LEED checklist aside for a minute. Do integrated design, and LEED will be automatic."

Advancing technology will continue to strengthen the need for human connections to the natural world. Projects reflecting integrated sustainable design will foster these connections and protect the environment. Smart use of renewable materials, such as North American hardwoods, in attractive, well-designed, environmentally preferable buildings, will contribute to sustainability and enhance the built environment. ■

CLICK FOR ADDITIONAL REQUIRED READING

The article continues online at:
archrecord.construction.com/resources/conteduc/archives/0510hardwood-1.asp

To receive AIA/CES credit, you are required to read this additional text. For a faxed copy of the material, contact Susan Regan at the Hardwood Council at 412-829-0770. The following quiz questions include information from this material.

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LEARNING OBJECTIVES

- *Explore environmentally preferable uses of American hardwoods.*
- *Specify and use American hardwoods more effectively and sustainably.*
- *Understand how life cycle thinking facilitates green building products assessment*

INSTRUCTIONS

Refer to the learning objectives above. Complete the questions below. Go to the self-report form on page 264. Follow the reporting instructions, answer the test questions and submit the form. Or use the Continuing Education self-report form on *Record's* web site—*archrecord.construction.com*—to receive one AIA/CES Learning Unit including one hour of health, safety, welfare credit.

QUESTIONS

1. The amount of hardwood growing in U.S. forests today is how much greater than it was 50 years ago?
  a. 10 percent
  b. 20 percent
  c. 45 percent
  d. 90 percent

2. What percentage of trees in U.S. hardwood forests are cherry and oak, respectively?
  a. Cherry 45%; Oak 26%
  b. Cherry 22%; Oak 37%
  c. Cherry 14%; Oak 45%
  d. Cherry 4%; Oak 52%

3. Which of the following are not American hardwoods?
  a. Ash, birch, cherry, elm
  b. Fir, pine, hemlock, spruce
  c. Hackberry, hard maple, poplar, red oak
  d. Sycamore, walnut, white oak, willow

4. Which of the following is not an environmentally preferable tactic:
  a. Using only rift-sawn lumber
  b. Using a wide variety of species
  c. Building up long, wide moldings from narrower, shorter elements
  d. Selecting the grade of the wood for the application

5. Which of these is not an environmentally important attribute of American hardwoods?
  a. Self-renewing
  b. Locally available
  c. Plantation grown
  d. Non-toxic

6. All of the following are smart specifying strategies for hardwood except which?
  a. Design to accommodate natural expansion and contraction
  b. Specify only clear, highest grade wood
  c. Juxtapose with other materials
  d. Give priority to local materials

7. Approximately how much American hardwood is certified under any system?
  a. Less than 5 percent
  b. About 10 percent
  c. About 25 percent
  d. About half

8. All of the following apply to American hardwoods except which?
  a. Durable
  b. Re-usable
  c. Low embodied energy
  d. Ozone depleting

9. Non-toxic, durable, low-maintenance wood finishes make it possible to use hardwood products in healthcare settings.
  a. True
  b. False

10. Hardwood floors can be used with solar or geothermal radiant heat systems.
  a. True
  b. False

About the Hardwood Council

The Hardwood Council serves architects, designers and builders by providing useful information about American hardwoods in sustainable design and building. As an independent, nonprofit organization, the Council advances better understanding of hardwood flooring, furniture, cabinetry and millwork, without bias toward specific products or manufacturers.

The Council's Web site, www.americanhardwoods.org, offers basic information about dozens of American hardwood species, background on sustainable forestry, and overviews of sustainable specifying, design, installation and finishing practices.

In addition to online information resources, The Hardwood Council provides:

• Sustainable Solutions, a handy kit containing 20 American hardwood species samples, a detailed brochure on hardwood sustainability and materials properties, and a CD that enables you to try out finishing alternatives on your computer's desktop;

• *Material Matters*, a series of white papers devoted to "conversations about sustainability and our surroundings" that document discussions with leading architects, designers, authors and architects;

• Tips & Techniques, a library of practical briefings on topics such as hardwood products selection, installation, finishing and care.

For more information about The Hardwood Council, and American hardwoods, please visit www.americanhardwoods.org

The Hardwood Council

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STO CORP. PRESENTS

Fluid Applied Air/Moisture Barriers for Moisture Control and Mold Prevention in Wall Construction

Fluid applied air/moisture barriers are effective and economical means of controlling moisture in wall assemblies. Moisture control assists in preventing mold growth in wall assemblies. Fluid applied air/moisture barriers also offer performance advantages over building wraps and traditional asphalt-impregnated felt or paper moisture barriers. They can be used in all types of wall construction over wood, gypsum and cement-based sheathings. They can also be used over prepared concrete and concrete masonry units. They generally consist of three components (*Figures 1a and 1b on page 204*):

1. A spray- or trowel-applied *joint treatment* for filling sheathing joints, spotting fasteners, and protection of rough openings, corners and other changes of plane in sheathed wall construction.
2. A *reinforcing* mesh or tape used in conjunction with the joint treatment to reinforce sheathing joints, corners, and changes of plane, and for repair of minor cracks in concrete or concrete masonry wall construction.
3. A *waterproof coating* applied by spray, roller or brush to prepared sheathing, concrete or concrete masonry wall surfaces.

When properly applied to sound supporting construction, these components function together as an air barrier and seamless moisture barrier in the wall assembly. Some of the advantages of a fluid applied air/moisture barrier include:

Effectively blocks air leakage	• Increases occupant comfort • Reduces energy costs by reducing heating and cooling loads • Reduces risk of condensation caused by air leaks through the wall construction
Seamless moisture barrier	• No tears, holes, or lap joints that can compromise performance in service • Reduces risk of installation errors
Protects sheathing and rough openings from weather damage during and after construction	• Minimizes risk of weather damage to sheathing and associated repair or replacement costs
Simple installation procedures	• No special tools or skills required; reduces labor costs
Durable	•Does not tear or lose its effectiveness with exposure to weather during construction or while in service
Structural/fully adhered	• Rigid and stable under air pressure loads, does not tear or blow off the wall with wind
Distinct colors	• Facilitates job site inspection and quality control
Water based	• Safe to use, easy clean-up, VOC-compliant
Provides opportunity for pressure equalized or pressure moderated wall design	• Minimizes risk of rain water penetration through wall assembly
Doubles as air barrier and moisture barrier in wall assembly	• Efficient use of materials

AIA/ARCHITECTURAL RECORD
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Use the learning objectives below to focus your study as you read **Fluid Applied Air/Moisture Barriers for Moisture Control and Mold Prevention in Wall Construction**. To earn one AIA/CES Learning Unit including one hour of health, safety, welfare credit, answer the questions on page 207, then follow the reporting instructions on page 262, or go to the Continuing Education section on *www.archrecord.construction.com* and follow the reporting instructions.

Learning Objectives

- Know the components of fluid applied air/moisture barriers
- Compare the advantages of fluid air/moisture barriers with building wraps and other moisture barriers
- Identify design considerations when incorporating fluid applied air/moisture barrier systems into wall assemblies

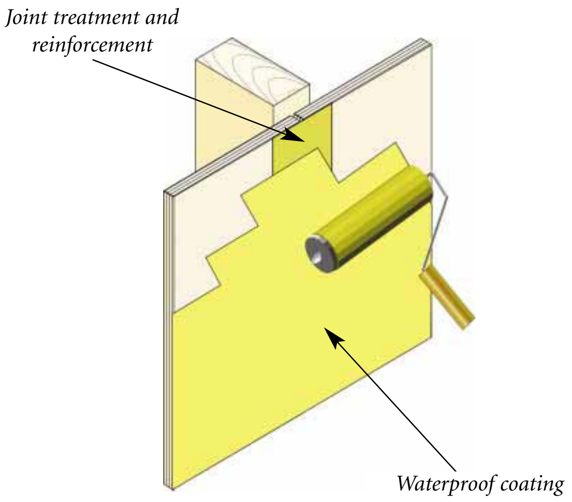

Figure 1a: *Fluid applied air/moisture barrier applied to sheathing by roller.*

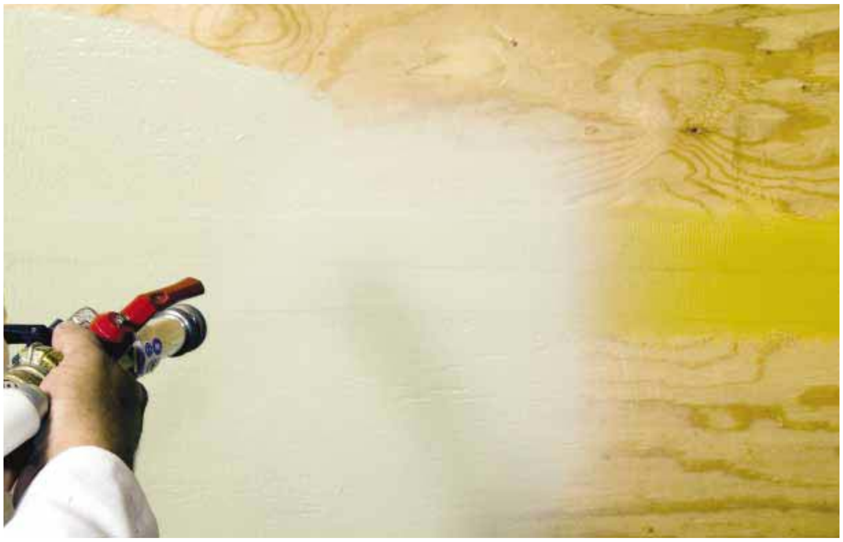

Figure 1b: *Fluid applied air/moisture barrier applied to sheathing by spray application.*

In the last decade, studies have shown air leakage to be a significant potential source of condensation and moisture accumulation in building envelope assemblies (see *CMHC, Commissioning and Monitoring the Building Envelope for Air Leakage,* by David J. Odom, III; and *Preventing Indoor Air Quality Problems in Educational Facilities: Guidelines for Hot, Humid Climates*).

By constructing an airtight building envelope, the risk of moisture problems—decay, corrosion, loss of insulation value, mold growth and indoor air quality (IAQ) problems—which can occur because of air leakage and condensation, are minimized. At the same time, airtight construction is likely to be less capable of drying than "air-porous" construction, in the event of water leakage or other unforeseen circumstances that cause water to enter into a wall assembly. The designer then must strive to prevent rain water penetration into the wall assembly, to construct an airtight building envelope assembly of compatible air barrier materials, and to enhance the drying potential of the wall assembly in his/her overall design strategy.

When incorporating fluid applied air/moisture barriers in wall assemblies, the following considerations are important to effectively control condensation and prevent moisture penetration:

Design Considerations

- Air permeability
- Continuity with other air barrier materials
- Structural integrity
- Durability
- Water penetration resistance
- Water vapor permeability
- Mechanical ventilation
- Construction details and sequencing
- Code compliance
- Climate

Air Permeability

The layers of material that make up a wall assembly have different air permeability. Figure 2 provides a comparison of typical materials used in wall assemblies and their air permeability values.

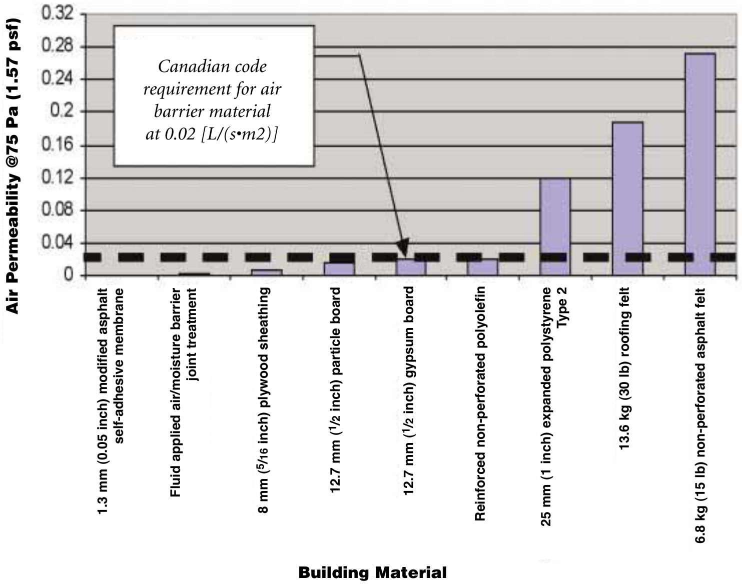

Figure 2: *Air permeability [L/(s·m2)] of fluid applied air/moisture barrier and common building materials.*

Sources of Data: *Canada Mortgage and Housing Corporation and Sto Corp.*

Energy codes in the United States have begun to require air tightness of the building envelope, but they are not specific about levels of air permeability for air barrier materials. The generally accepted level based on National Building Code of Canada requirements is 0.02 L/(s·m2) at 75 Pa pressure (0.004 cfm/ft2 at 1.57 psf). While many common building materials like plywood and gypsum wallboard meet this standard, a sheathed wall assembly will not perform well as an air barrier unless the joints are treated with an air barrier *material*. The sheathed wall assembly with treated joints then becomes an air barrier *sub-system* of the total building envelope air barrier *system*. The total building envelope air barrier system consists of all the interconnected air barrier *materials*—for example, treated wall sheathing, roof membrane, foundation waterproofing, windows and doors, and the air barrier connection materials between them.

Air Barrier Continuity

The overall design concept of air barriers in building construction is the creation of a continuous airtight membrane around the building envelope. Therefore, air barrier materials in wall assemblies, to be effective, must be *continuous*. Breaks in air barrier continuity cause air leaks. In cold climates the breaks can allow significant amounts of warm moisture-laden air to escape from the interior environment and condense on a cold surface in the wall assembly. Conversely, in hot, humid climates, breaks in the air barrier permit moisture-laden air from the exterior environment to infiltrate the building envelope and potentially condense on a cold surface in the wall assembly. Any penetration through the wall assembly or termination of the wall assembly must therefore be detailed to maintain the continuity of the air barrier materials to effectively create an air barrier system. *Without continuity of the air barrier materials in the wall assembly, air barrier system performance is less effective*. The design/construction professional must take material compatibility and construction sequencing into account when designing an airtight assembly to ensure *continuity*. A number of connecting air barrier materials exist that are compatible with fluid applied air/moisture barriers to make transitions from one material to the next, for example, rubberized asphalt membrane tapes to connect from wall sheathing to foundation, or low-expanding urethane foam sprays for use between windows and rough openings.

Air Barrier Structural Integrity

Structural integrity of air barriers is important because wind loads are transferred to the most airtight components in a wall assembly—the air barrier materials—and in turn, are transferred to the structure. Negative and positive wind loads stress air barrier materials. If the materials tear or displace with loading, they lose their effectiveness as air barriers. Some building wraps have low air permeability, but they do not perform well when commonly installed because they have many seams that reduce their effectiveness against air leakage, and they are non-structural. If the seams in building wraps are not taped, they do not perform well as air barrier materials. Because building wraps are non–structural, they are susceptible to displacement and tearing from negative wind gusts in cavity wall construction. This compromises their performance in service.[1]

Fluid applied air/moisture barriers are fully adhered. Adhesion to sheathing exceeds the strength of the sheathing. Tensile adhesion tests show that the paper or glass mat facing fails in gypsum based sheathings, while unfaced sheathings like plywood show adhesive failure at loads in excess of 344 kPa (50 psi, could equate to more than a 2560 km/hr [1600 mph] wind speed). The structural strength of the fluid applied air/moisture barrier in effect equates to that of the sheathing. Deformation while in service is limited to the deformation of the sheathing. *This means no tears and no compromise in performance caused by structural loading*, provided the sheathing and supporting frame are adequate to resist loads.

Air Barrier Durability

While capable of resisting wind loads without compromise in performance, air barrier materials must also demonstrate durability in a number of other ways, particularly if the air barrier is concealed and inaccessible for maintenance. Durability criteria include:

- Resistance to puncture
- Resistance to pests—rodents, termites, carpenter ants, and other insects
- Resistance to low but sustained negative pressures from building stack effect and HVAC fan effect
- Ability to withstand stress from thermal and moisture movement of building materials, and stress from building creep
- Resistance to UV degradation (during the construction period)
- Resistance to mold growth
- Resistance to abrasion

Fluid applied air/moisture barriers generally do not provide a food source for insects or other pests. By virtue of their excellent adhesion to sheathing and prepared concrete or masonry substrates, they are resistant to puncture and they resist loads imposed by stack effect and fan effect, as well as wind loads. Their resistance to stresses imposed by thermal and moisture movement, and building creep, is mainly dependent on the ability of the joint treatment material to span gaps in sheathing without cracking. This performance, in turn, is dependent on the physical properties of the specific joint treatment material. Similarly, the UV resistance, resistance to mold growth, and abrasion resistance are dependent on the physical properties of the joint treatment and waterproof coating materials.

Water Penetration Resistance

The traditional moisture protection used in wall construction is asphalt-saturated felt or kraft waterproof building paper. The terms weather-resistive barrier or moisture barrier are often used to describe these components in wall construction. They are generally installed over sheathing by lapping them shingle-style and fastening with nails, screws or staples to the sheathing. Their general purpose in walls is to protect against ingress of incidental water into the building and to protect moisture-sensitive components like gypsum sheathing in the event of a breach in the outer wall covering, such as a crack in stucco. Building wraps are often used in place of asphalt felt in wall construction, often with the same perceived purpose. The water resistance, air infiltration resistance, and vapor permeability characteristics of building wraps vary widely, depending on the brand of wrap selected. (See references, PHRC Report No. 59). Seamless fluid applied moisture protection provides a significant improvement over traditional moisture protection and building wraps. *In fact, they can be 10 times more resistant to water penetration than building wraps and nearly 200 times more resistant to air leakage than asphalt felt* (refer to Figures 2 and 3).

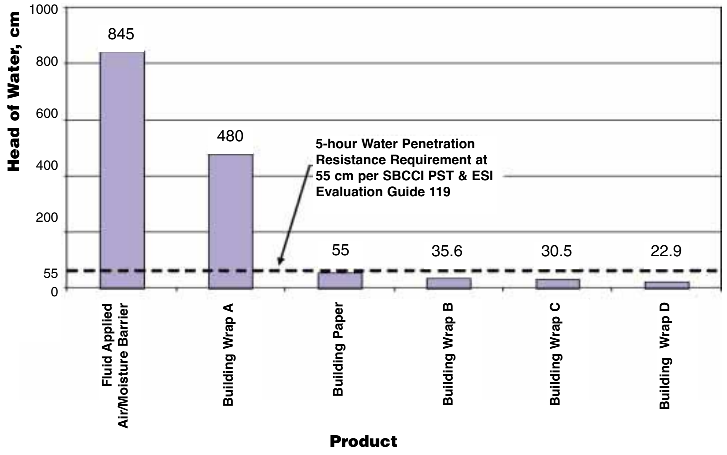

Figure 3: *Water penetration resistance of fluid applied air/moisture barrier material compared to building wraps and building paper. Check online material for Figure 3 notes.*

Water Vapor Permeability

A fluid applied air/moisture barrier may or may not be a vapor-retarding material. The generally accepted definition of a vapor-retarding material is one that has a water vapor permeance of 57.4 $\text{ng}/(\text{Pa}\cdot\text{s}\cdot\text{m}^2)$ [1.0 perms] or less. In Table 1, the fluid applied air/moisture barrier components are not vapor retarders. The joint treatment has a vapor permeance of 994 $\text{ng}/(\text{Pa}\cdot\text{s}\cdot\text{m}^2)$ [17.3 perms] and the waterproof coating has a vapor permeance of 327 $\text{ng}/(\text{Pa}\cdot\text{s}\cdot\text{m}^2)$ [5.7 perms], about the same as Type 15 building felt.

Building Material	Water Vapor Permeance (Perms)	Water Vapor Permeance $\text{ng}/(\text{Pa}\cdot\text{s}\cdot\text{m}^2)$
4 mil Polyethylene[1]	0.08	**4.60**
6 mm (1/4 inch) Plywood[3] (ext glue)	0.7	**40.2**
101 mm (4 inch) Brick[3]	0.8	**46.0**
203 mm (8 inch) Concrete Block[3]	2.4	**138**
25 mm (1 inch) Expanded Polystyrene[1]	5	**287**
Type 15 Building Felt[2]	5.6	**322**
Fluid Applied Air Moisture Barrier Waterproof Coating	5.7	**327**
19 mm (3/4 inch) Plaster on Metal Lath[3]	15	**862**
Fluid Applied Air Moisture Barrier Joint Treatment	17.3	**994**
9.5 mm (3/8 inch) Gypsum Wallboard[3]	**50**	**2873**

Table 1: *Water vapor permeance of fluid applied air/moisture barrier materials and common building materials. Check online material for Table 1 notes.*

The purpose of a vapor retarder in wall construction is to minimize water vapor diffusion through the wall assembly and thus reduce the risk and the amount of condensation on cold surfaces in the wall assembly. Whether or not a vapor retarder should be placed in a wall assembly and where it should be placed must be carefully evaluated in relation to climate, the physical characteristics of other components of the wall assembly, and interior relative humidity conditions. In cold climates the predominant water vapor diffusion direction through most of the year is from the inside to the outside, as warm, humid air from the interior environment moves in the direction of cold, dry outside air. Conversely, in hot, humid climates, the predominant water vapor diffusion direction through most of the year is from the warm, humid outside environment towards the cooler, dryer, air-conditioned interior environment. Based on these general conditions, a vapor retarder is customarily placed on the interior of wall construction in cold climates and on the exterior in hot, humid climates. A vapor retarder should not be placed on the interior in hot, humid climates, since it will potentially cause condensation by restricting vapor diffusion to the interior. The use of interior vapor retarders has been shown to be a contributing cause in many cases of moisture problems and IAQ problems in buildings in hot, humid climates. One tool that is available to assist in making decisions about whether a vapor retarder is needed and where to place it in the wall assembly is a water vapor transmission analysis that can be performed manually (see ASHRAE Handbook—Fundamentals, chapters 21 and 22) or by computer (Trechsel, *Moisture Analysis and Condensation Control in Building Envelopes*).

Mechanical Ventilation

A properly functioning air barrier *system* will limit the influence of air infiltration and exfiltration on the heating and cooling loads of the interior environment. This can increase the efficiency of the HVAC system, which translates into energy cost savings. However, the mechanical ventilation system must still perform its basic functions of:

- Ventilation and exhaust
- Proper distribution of makeup air to interior spaces
- Dehumidification of air
- Filtration of outdoor air

Wind effects, stack effects, fan effects and space configuration and partitions influence how the mechanical ventilation system must be designed to perform adequately. ASHRAE handbooks provide guidance on mechanical ventilation, and design and control of interior relative humidity conditions to control microbial growth, to minimize condensation potential, and to provide occupant comfort, in relation to air leakage.

Construction Details and Sequencing

"As much as 90 percent of all water intrusion problems occur within one percent of the total building exterior surface area. The one percent of the structure's façade contains the terminations and transition detailing that all too frequently lead to envelope failures."[3]

Construction detailing is a critical component for the success of any wall assembly. The designer must create details that effectively:

Control rain water penetration that may occur via:

- Gravity flow—water that flows down and to the interior if surfaces are sloped towards the interior, for example, an improperly sloped brick ledge
- Kinetic energy—rainwater, for example, being blown directly into large openings
- Capillary action—the tendency of water to travel through narrow openings or cracks in materials toward dryer surfaces, for example, a crack in a mortar joint
- Pressure differentials—the effects of wind pressure, stack effect or mechanical ventilation that create pressure differences across the building envelope, and drive water through cracks or openings

Control condensation that may occur via:

- air leakage
- diffusion

The contractor must in turn coordinate and sequence work so that details are properly constructed. Given that today's buildings are generally "tighter" than they were 50 years ago, the importance of eliminating water intrusion into wall assemblies increases substantially, since water in walls may not readily dry. Some details are fundamental, such as the proper sloping of sills and ledges to the exterior, use of drip edges at soffit returns, capillary breaks in construction joints, or lapping of the air/moisture barrier over flashing at the base of a wall (Figure 4) to direct water to the exterior. Other details are more complex, such as maintaining the continuity of the air barrier at a window penetration (Figure 5) and integrating the air/moisture barrier with sill flashing. Whatever the detail, whether straightforward or complex in nature, the development and execution of details is vital to the long term success of the wall assembly, regardless of how well the air/moisture barrier *system* performs. An important advantage of a fluid applied air/moisture barrier in the wall assembly is that it can mitigate or eliminate one of the major forces that cause water infiltration into walls: pressure difference. The fluid applied air/moisture barrier, in combination with venting and compartmenting, can effectively enable the pressure behind the cladding material to equalize with the pressure outside, and prevent rain water penetration caused by pressure differentials (pressure equalized rainscreen).

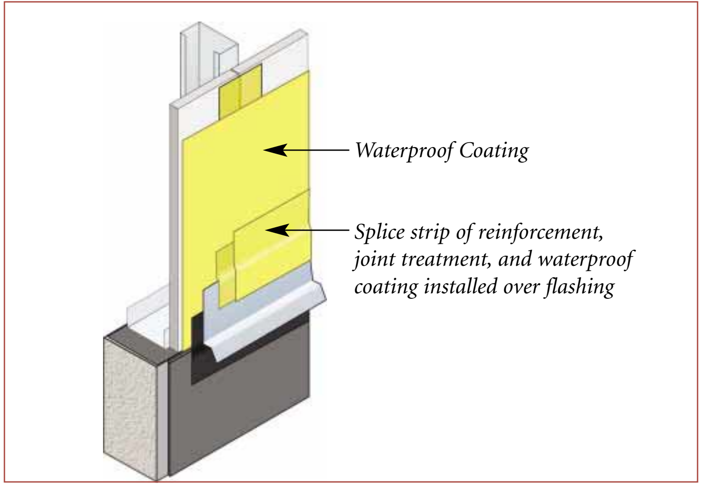
Waterproof Coating
Splice strip of reinforcement, joint treatment, and waterproof coating installed over flashing

Figure 4: *Fluid applied air/moisture barrier lapped onto flashing at the base of the wall to "splice" the two materials and shed water onto the flashing and to the exterior.*

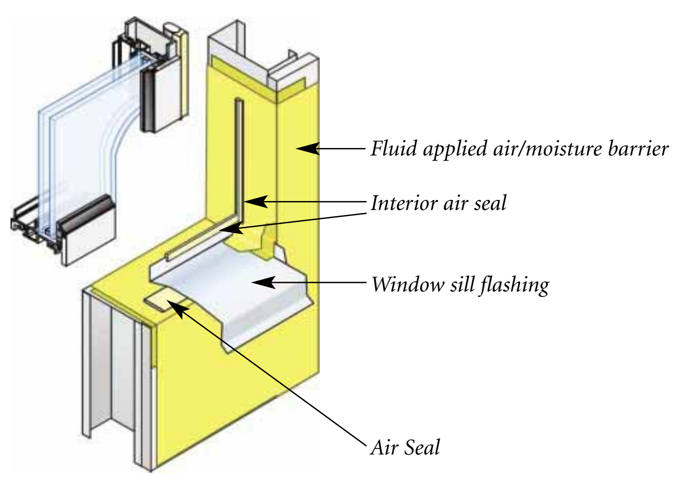

Figure 5: *Integration of the fluid applied air/moisture barrier at the rough opening with interior air seal and sill flashing beneath the window.*

CLICK FOR ADDITIONAL REQUIRED READING

The article continues online at:
archrecord.construction.com/resources/conteduc/archives/0510sto-1.asp

To receive AIA/CES credit, you are required to read this additional text. For a faxed copy of the material, contact Sto Corp. at 678-553-3267. The following quiz questions include information from this material.

Learning Objectives

- Know the components of fluid applied air/moisture barriers
- Compare the advantages of fluid air/moisture barriers with building wraps and other moisture barriers
- Identify design considerations when incorporating fluid applied air/moisture barrier systems into wall assemblies

Instructions

Refer to the learning objectives above. Complete the questions below. Go to the self report form on page 262. Follow the reporting instructions, answer the test questions and submit the form. Or, use the Continuing Education self report form on *Record's* web site—*archrecord.construction.com*—to receive one AIA/CES Learning Unit including one hour of health, safety, welfare credit.

Questions

Q: 1. United States energy codes are always specific about the levels of air permeability for building materials.
A: a. True
b. False

Q: 2. Fluid applied air/moisture barriers' excellent adhesion to sheathing and prepared concrete or masonry substrates makes them resistant against:
A: a. Wind loads
b. Insects or other pests
c. Mold growth
d. UV degradation

Q: 3. Seamless fluid applied moisture protection is nearly ______ times more resistant to air leakage than asphalt saturated felt.
A: a. 100
b. 150
c. 200

Q: 4. A fluid applied air/moisture barrier is also always a vapor-retarding material.
A: a. True
b. False

Q: 5. In cold climates, a vapor retarder is customarily placed on:
A: a. The interior side of the wall
b. The exterior side of the wall

Q: 6. "As much as 90 percent of all water intrusion problems occur within ___ percent of the total building exterior surface area."
A: a. 1
b. 5
c. 10

Q: 7. Rain water blown directly into large openings is an example of which mechanism of rain water penetration?
A: a. Gravity flow
b. Kinetic energy
c. Capillary action
d. Pressure differentials

Q: 8. One of the major forces that causes water infiltration into walls is:
A: a. Kinetic energy
b. Gravity flow
c. Pressure difference

Q: 9. Fluid applied air/moisture barriers are proprietary materials and are not listed in model codes.
A: a. True
b. False

Q: 10. In which climate should you use a low permeance rigid insulation on the exterior to resist vapor diffusion to the interior?
A: a. Hot, humid climates
b. Cold climates

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Residential

California's inspired antisprawl solution: Bring new life to the suburbs

BRIEFS

L.A. puts limits on mansions
The McMansion is becoming an endangered species in parts of Los Angeles as the fast-growing city has taken steps toward limiting the size of newly built houses. In July, the city council voted to restrict the floor area of new homes to 40 percent of their lot size but no less than 2,400 square feet. The temporary measure only applies to Sunland and Tujunga, two neighborhoods where developers have been building relatively large homes, some of which cover their entire lot, in what some city officials dub "mansionization."

ASU builds affordable green house Long heralded as the future of urban environments, green architecture is also making a mark in the rural desert. Students from the Arizona State University Stardust Center for Affordable Homes and the Family (partnered with local Navajo groups) have designed and built a sustainable and affordable house in Nageezi, New Mexico. With a design inspired by Navajo culture, the house includes passive solar heating, recycled rainwater and materials, and passive cooling. An elderly Navajo couple now call it home. For more information, go to www.asu.edu/stardust.

Modern condo is landmarked
A 40-year-old condo is the last building you would expect to be honored on the National Register of Historic Places, but that's exactly what happened to Sea Ranch Condominium I in July. The listing is even more unusual given that two of the architects who designed the building, Richard Whitaker and Donlyn Lyndon, are alive. The complex on the ocean coast in Northern California was designed by the firm of Moore Lyndon Turnbull Whitaker, which merged Modernism and regional style to create wood structures with sloping roofs.

Students turn phone books into house Taking recycling to new heights, architecture students from Nova Scotia's Dalhousie University have built a house using more than 7,000 phone books. Located in Sackville, north of Halifax, the "phone booth" takes up an area of less than 200 square feet and cost about $2,500 to construct. The closely packed books help insulate the house and protect it from water infiltration, while a fire pit provides heating for the cold Canadian winter.

Green Dollhouse competition
Sustainable living is no longer just for humans; dolls can now share in the fun. The Green Dollhouse Project competition, partially sponsored by AIA and the U.S. Green Building Council, encouraged architects and design students to include green ideas in their entries. Dollhouses were judged both on their sustainability and their value as toys. For more information, go to www.greendollhouse.org.

Gregory Hafkin

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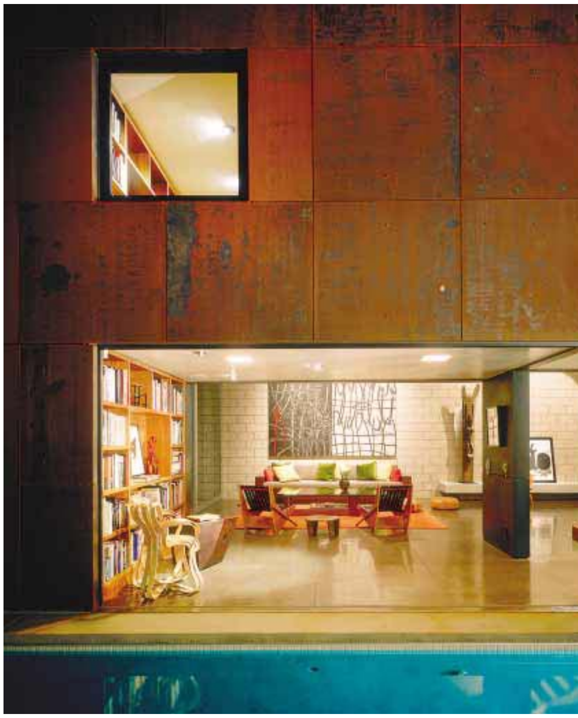
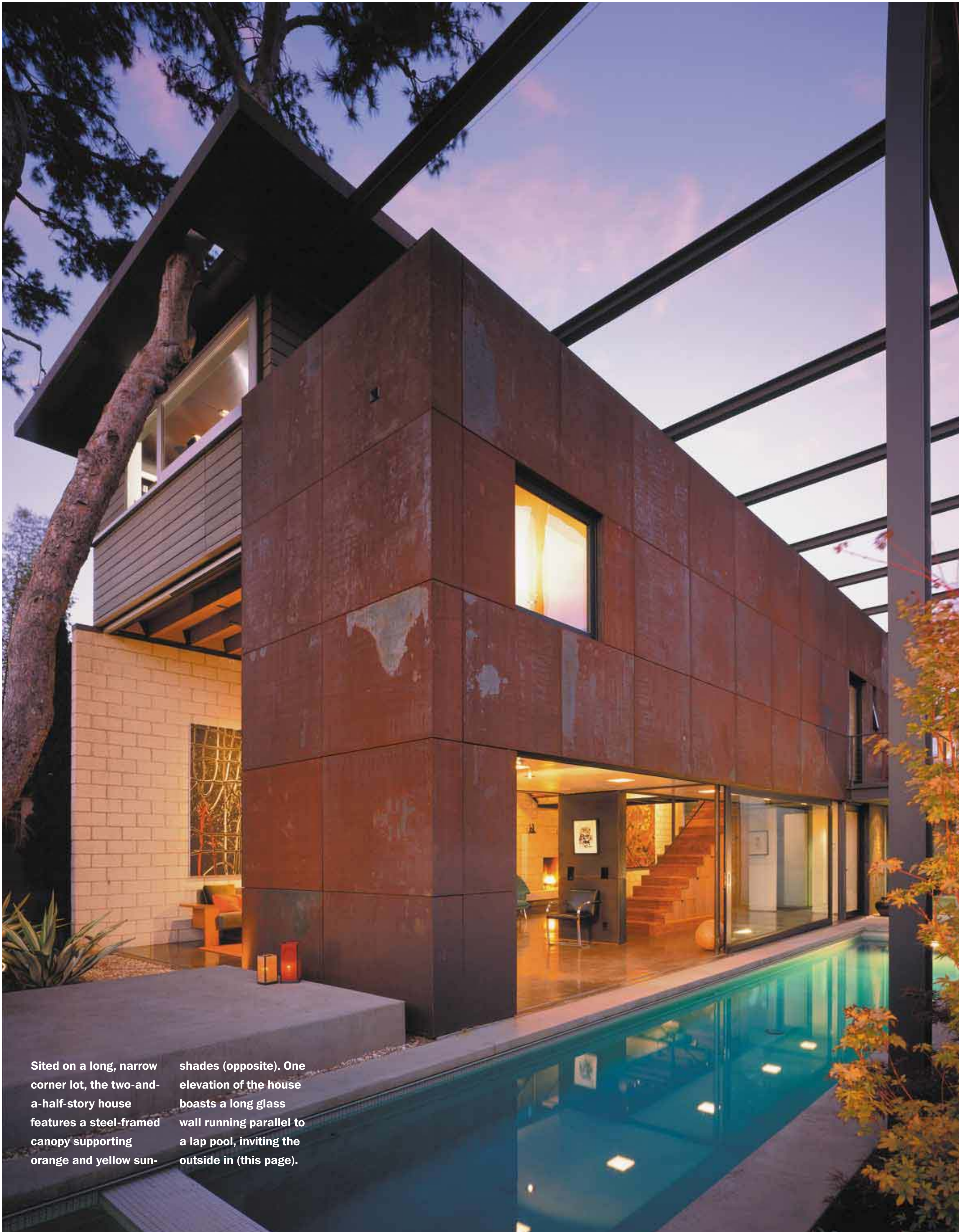
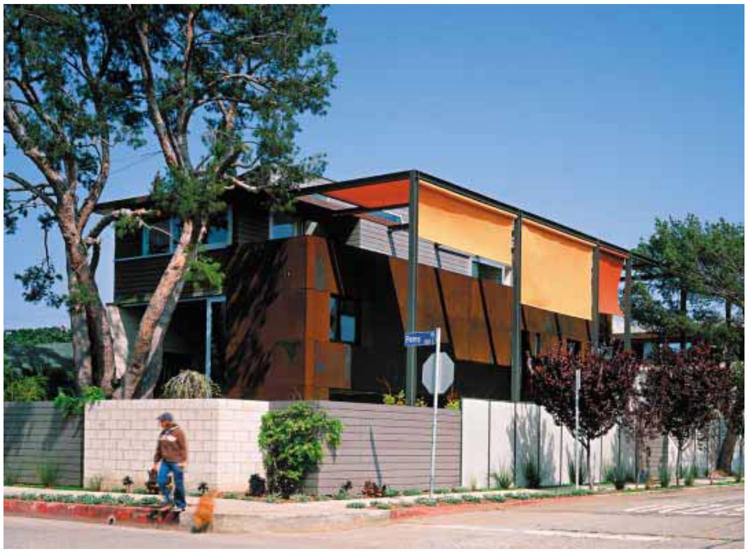
PHOTOGRAPHY: © ERHARD PFEIFFER

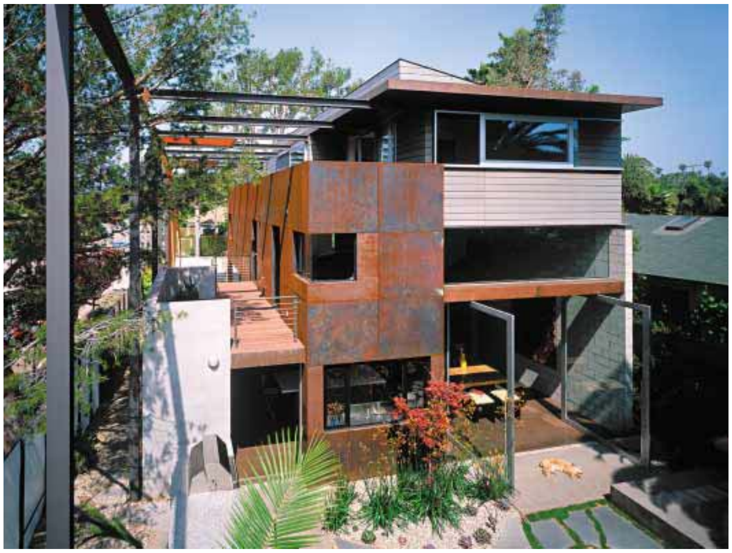


The population of California will nearly double over the next 35 years, growing to almost 60 million by 2040, says the state's Department of Finance. As the number of Californians balloons, so does the size of their homes. According to the U.S. Census Bureau, houses nationwide have grown from an average of 1,130 square feet 50 years ago to 2,150 square feet today, and the Golden State has contributed to this increase. It could undermine the very things that attract people to California—its physical beauty and relaxed lifestyle. The architects and homeowners featured in this section are countering the trend by offering alternatives to the usual pattern of sprawl development. Instead of building enormous McMansions, they are creating infill projects in established neighborhoods and on modest-size lots. And the houses they have created exploit the state's benign climate to blur the separation between indoors and out, and highlight a way of living that is part of everyone's California dream. *Jane F. Kolleeny*



Sited on a long, narrow corner lot, the two-and-a-half-story house features a steel-framed canopy supporting orange and yellow sunshades (opposite). One elevation of the house boasts a long glass wall running parallel to a lap pool, inviting the outside in (this page).





Steven Ehrlich combines primitive and Modern aesthetics at his **700 Palms Residence**

By Joseph Giovannini

PHOTOGRAPHY: © JULIUS SHULMAN, EXCEPT AS NOTED; ERHARD PFEIFFER (THIS PAGE)

Venice, California, has been described as a state of mind, a beach community in which artists and architects have been comfortable stretching their artistic limits since World War II, when it became home to the Beat Generation, and then the cradle of the Light and Space art movement. But at this point in Los Angeles history, Venice has also come to represent a major real estate phenomenon that is convulsing the old pattern of suburban development. As properties are sold at major prices, new owners are enlarging existing structures or building new ones at a much bigger scale, reflecting the increase in underlying property values. Inflationary values are producing steroidal results.

Steven Ehrlich, who first bought and remodeled a Craftsman-style house here decades ago, before a long interlude living in Santa Monica, returned to familiar but changed territory when he bought a corner lot to build a new home for himself. He was susceptible to the usual real estate pressures, but was also thinking large to accommodate his wife, Nancy Griffin, and family. The house had to be generous and hospitable enough to entice three grown children back for visits.

Pushing the envelope is a metaphor for most architects. But for Ehrlich, it meant building the house not only out to the lot line, but also establishing the height limit across the site. He erected translucent walls at the edges of the property to claim its entirety as a private outdoor precinct, and then extruded the lot line up with a structural cage that establishes the envelope of the site in three dimensions. Rather than simply designing in terms of square footage and plan, he thought in terms of volume and section. By conceiving the house as filling the full site and thinking spatially at the outset, Ehrlich vastly increased the apparent territory of occupation of the postage-stamp lot, which measures 132 by 43 feet.

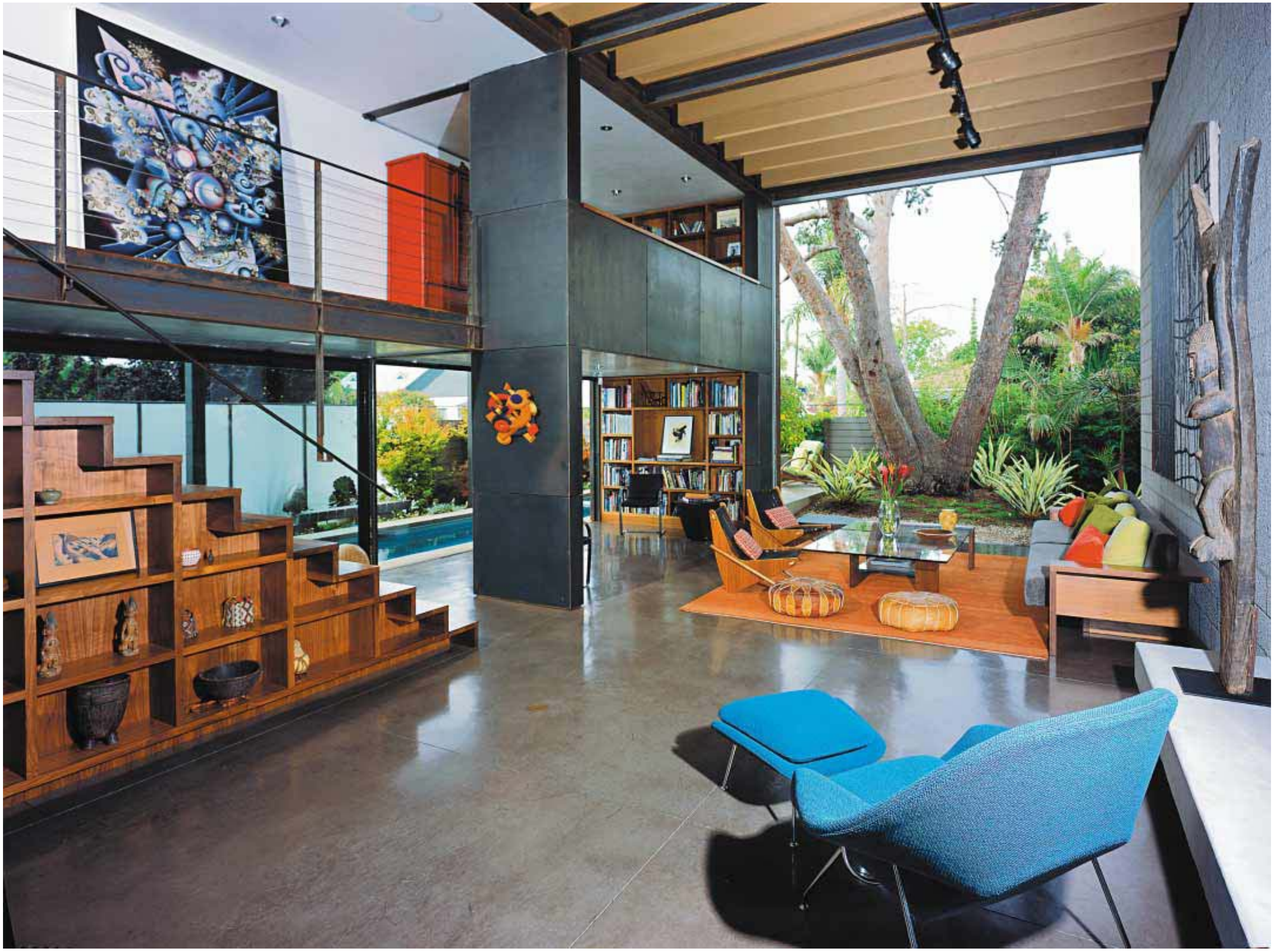
The architect, however, never proposed a mindless McMansion, or even a Modernist McMansion, that would reside as an object isolated in the space of thin, yard-line setbacks. Instead, he explored an approach that would illustrate the traditional California inside-outside relationship of the house to the yard. In a pavilion at the back of the lot, he nestled a studio and guest apartment, separated by a courtyard, bounded at the near end by the main structure, a steel, glass, and block armature that held bedroom pods for his daughters and the master bedroom suite on the top floor.

Ehrlich articulated each element of the program so they do not congeal in a single block, but form a highly porous structure of glassy solids set in voids that blur the boundaries between inside and out, up and down. The volume is large but not monolithic and imposing. What truly makes the house porous, however, is the range of opportunities for opening and closing the volumes to the outside, and even to other parts of the interior. Richard Neutra would be transfixed with envy at the size and quantity of doors and window walls that slide or pivot open, some of them two and a half stories tall.

Within the steel structural frame on the front facade, Ehrlich stretched a mobile sunscreen of fabric that, at the touch of a button, moves to open the house to views of the sky, or closes to protect it from

Joseph Giovannini is an architect and critic based in New York and Los Angeles.

Project: *700 Palms Residence, Venice, Calif.*
Architect: *Steven Ehrlich Architects—Steven Ehrlich, FAIA, principal/project architect; Mathew Chaney, job captain; Thomas Zahlten, AIA, Yoshiaki Irie, Michael Pardek, Steffen Doelger, Nicole Pflug, Martin Ven-Bentum, Manuel Manuelian, Aroonrat Lertnimitr, project team*
Consultants: *Parker Resnick (structural); Doug Taber (mechanical); Jay Griffith (landscape); Woods Davey (site sculpture)*
General contractor: *Mark Shramek Construction*

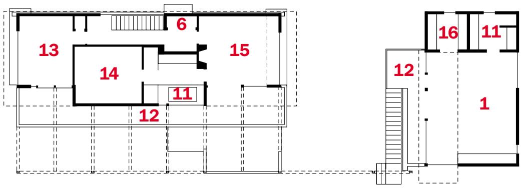


An Aleppo pine tree grows outside the 16-foot sliding doors of the living room, providing a dramatic centerpiece for the room.

the sun. At the ground level, a long glass wall parallel to a lap pool slides back, bringing the element of water visually into the house. When the front and rear window walls open, the living space—both inside and out—flows in one continuous sweep, perfect for casual parties with large numbers of ambling guests. "I was interested in transformation," says Ehrlich. By simply moving glass partitions, large and small, he can merge and separate space in a variety of combinations. The house becomes participatory, an environment to be shaped and reshaped according to weather, degrees of privacy, and simple fancy. It invites its occupants into the everyday making of space.

In addition to the California indoor-outdoor theme, Ehrlich imported another cultural element. Early in his career, he spent six years in Morocco and Nigeria, where he was impressed by courtyard houses that create a sense of community within outdoor precincts. Here in Venice, the architect infused the house with memories of African vernacular architecture by claiming the entire yard as a living precinct, and within it, creating outdoor courts, front and back, that break the yard into intimate places inflected with unique character. The pool area is athletic and sunny; the front yard, with its huge tree, is a contemplative corner of nature. The back court, with its raised, heated seating plinth opposite a barbecue, is the festive social hub. The main indoor space, two stories tall, is a savannah of living, with a long dining table and generous seating, perfect for grazing *en famille* or alone with a book and some wine.

1. *Living room*
2. *Pool*
3. *Powder room*
4. *Dining room*
5. *Kitchen*
6. *Laundry*
7. *Storage*
8. *Garage*
9. *Bridge*
10. *Bedroom*
11. *Bathroom*
12. *Deck*
13. *Library*
14. *Closet*
15. *Master bedroom*
16. *Kitchenette*



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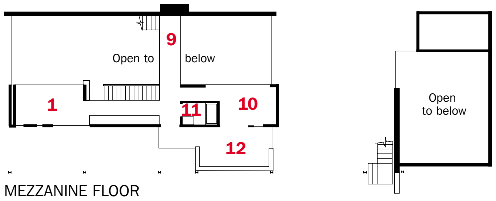
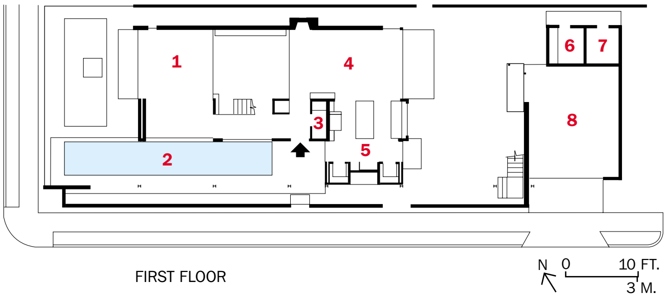
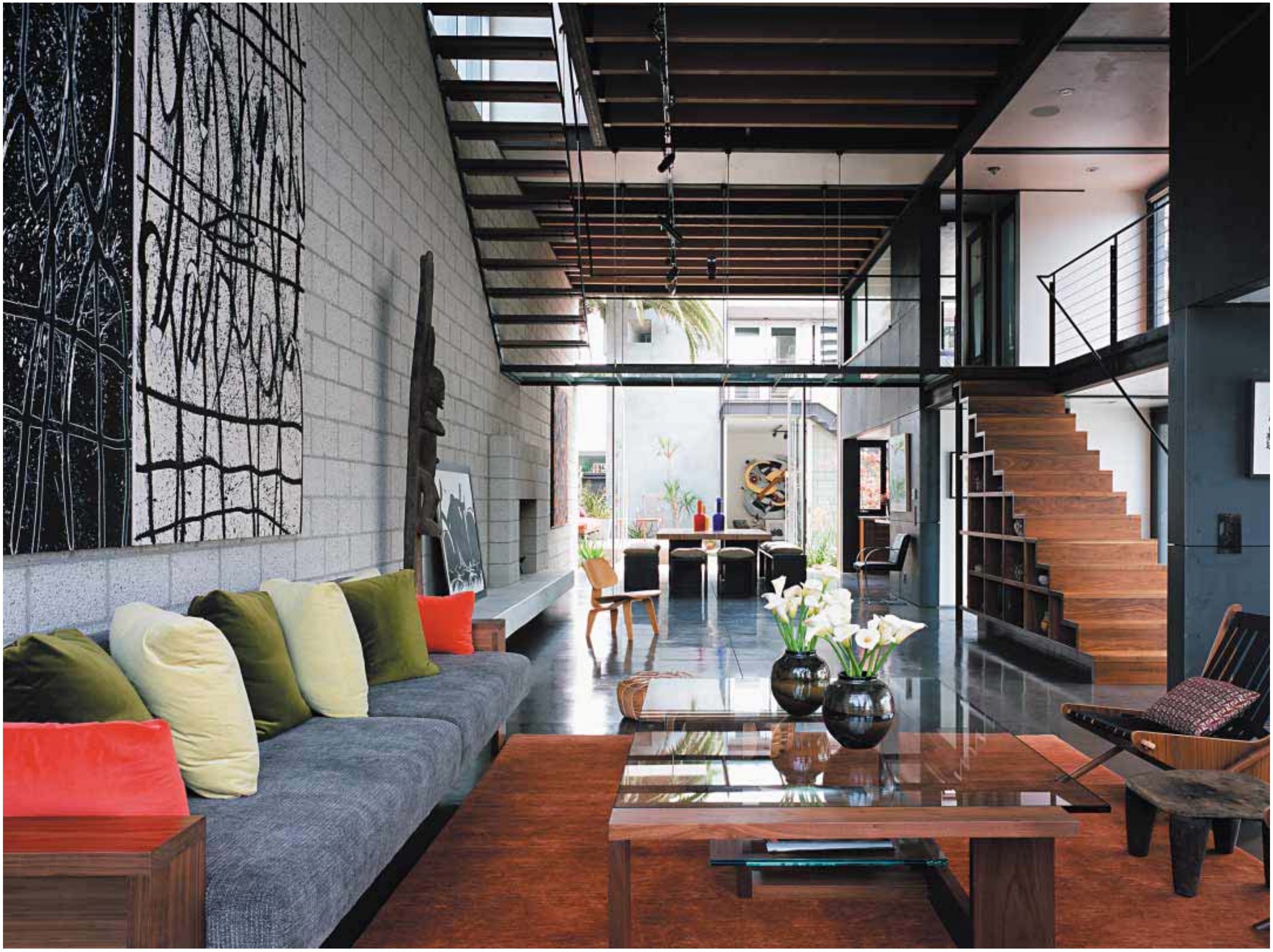


MEZZANINE FLOOR



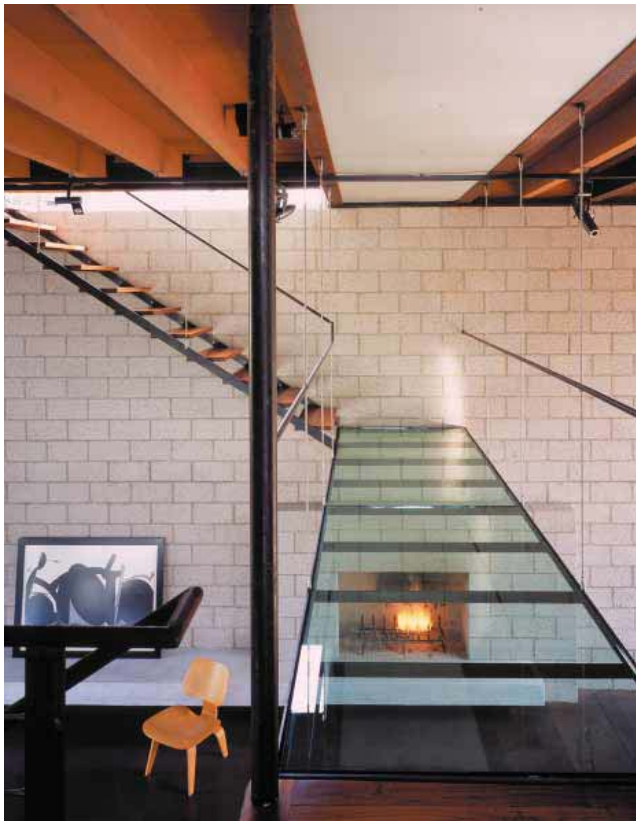
FIRST FLOOR



Everywhere, the architect materialized his idea of an expanded and accommodating envelope with a collage of steel, block, glass, and metal that turns the structure into a spatial quilt. "There's no paint in the house," says Ehrlich, referring to a palette whose colors and textures are integral. Concrete materials are at the service of an abstract, Mondrianesque composition in three dimensions, giving the design body and inflecting its Modernist aesthetic with fundamental, even primitive, sensibilities.

In this design for a house of his own, Ehrlich intentionally spliced together cultures and invented a hybrid that is both contextual by California traditions and international in a sense never even suspected by Philip Johnson and Henry-Russell Hitchcock when they coined that famous term for a style in 1931. A building need not be white to be abstract. ■

A glass-and-steel suspended bridge spans the space above the living/dining room. A Japanese-style *tansu* stair with storage below leads to it. The bridge, in turn, leads to a floating stair to the upstairs.



PHOTOGRAPHY: © ERHARD PFEIFFER (THIS PAGE)

Sources

Glazing: *American Glazing*

Awnings: *Alpha Productions*

Photovoltaics: *Solar.com*

Siding: *Trex*

Concrete block: *Orco*

Stucco: *Flexirock*

Exterior panels: *Lumisite*

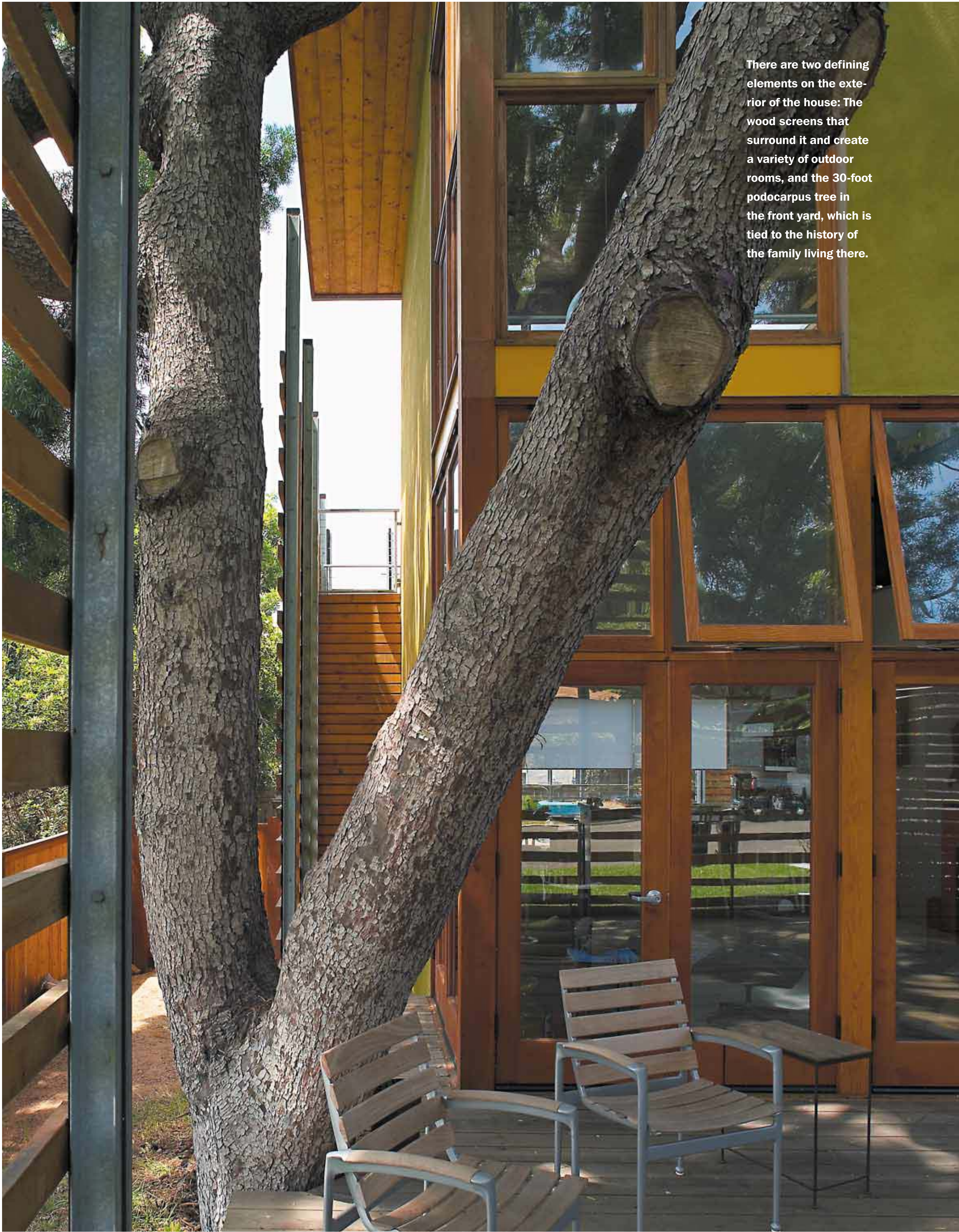
Appliances: *Sub-Zero/Wolf*

Fixtures: *GS; Toto*

Track lighting: *LSI*

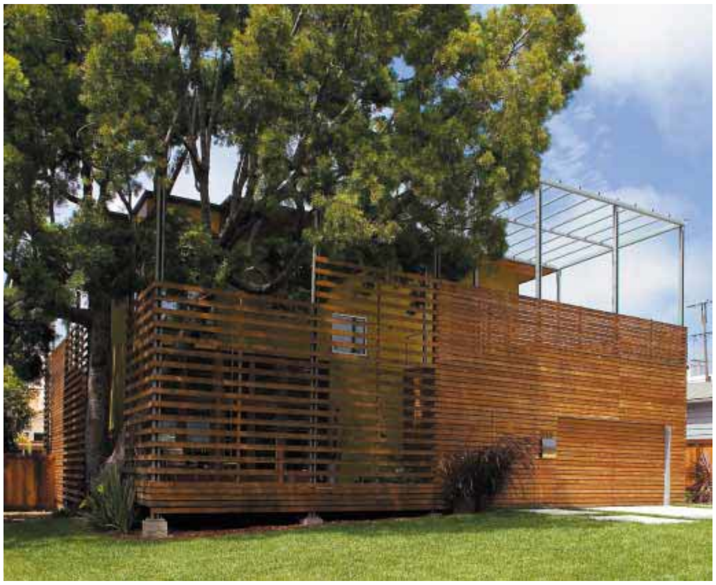
Custom interiors: *David Albert (tansu stair, sofa, coffee table, and cabinets)*

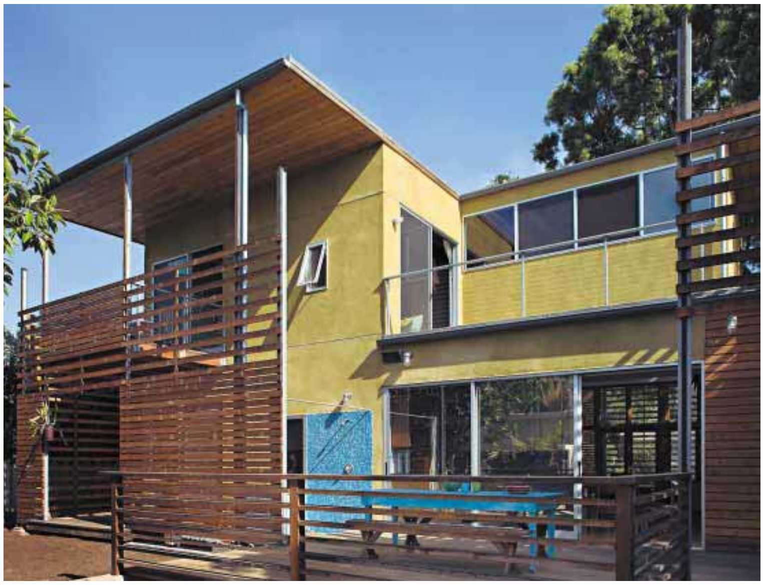
For more information on this project, go to Residential at **www.archrecord.com**.



There are two defining elements on the exterior of the house: The wood screens that surround it and create a variety of outdoor rooms, and the 30-foot podocarpus tree in the front yard, which is tied to the history of the family living there.

Public shrouds the **Lee Tree House** in screens, giving character to a nondescript bungalow





By Ann Jarmusch

In a crowded, older subdivision of La Jolla, California, Gravilla Street stands out for anyone making a pilgrimage to visit El Pueblo Ribera, the walled compound of beach cottages Rudolph Schindler designed in 1923. Now, several blocks inland on the street, the San Diego firm Public has renovated an ordinary house with shades of Schindler. Using simple, standard materials and stark geometry, the architects devised an introverted design to shield the residents' indoor-outdoor life from public view, and like Schindler, built the project themselves.

Torrey and Kimberly Lee bought the one-story, 1,200-square-foot home from Torrey's aunt in 2003. A huge conifer tree, planted years ago near the house's southwest corner by a relative, added to the property's sentimental value. But with two young daughters and an urgent need for more living space, the Lees were willing to sacrifice the thriving podocarpus in exchange for another bedroom and bathroom in what was originally a two-bedroom, one-bath house.

After the Lees hired Public for the renovation, architects James Brown and James Gates championed the evergreen. Not only beautiful in its branch structure, the tree also supports dense foliage that shades the house from the strong afternoon sun. A consultant confirmed that new foundations could be laid without killing the tree's extensive roots. With that, Public was determined "to preserve and celebrate the tree" as a symbol of one family's stake in a home over several generations, said Brown.

Unwilling to accept the tree as a mere decorative anchor or sunshade to work around, the architects reconsidered the tree, the house, and the entire lot, which included an expansive, underused front lawn. They decided to bring the conifer into the realm of the house, showcasing it in a glazed, 22-foot-tall corner space. They also extended the usable living area under the tree's generous canopy by adding a front deck that is level with the house's first floor. With lawn to spare, a tall, slatted-wood screen, the project's third defining element, rises to enclose the deck and tree trunk, creating a semiprivate outdoor room of 420 square feet.

This boxy, nearly continuous screen made of inexpensive fascia boards surrounding the house and tree breaks in places to allow access to new decks and a blue-tiled outdoor shower. The spaces between the screen, house, and tree also affect the way people experience the residence, Gates said.

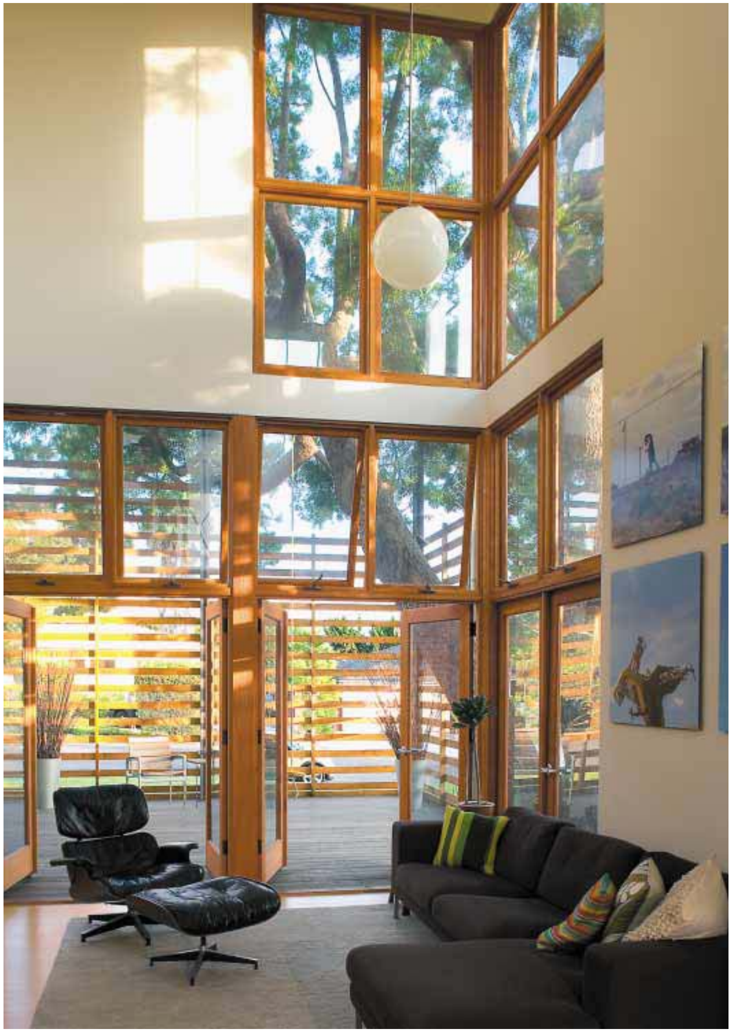
The screen's height ranges from 16 to 18 feet, and the spacing of its horizontal boards shifts, depending on the amount of privacy desired for specific portions of each elevation. Facing the street, the screen is nearly solid, masking the existing garage and concealing a gate to the front deck and glazed entrance. As the screen continues across this deck, gaps between the boards increase to several inches. On the sides with two rear decks, where openness is preferable, Public substituted steel cable for wood screen.

After one passes through the front gate and enters the spacious outdoor room, the screen's personality changes instantly from a shield to a scrim. A bank of five glazed doors surmounted by large, operable windows disguises the house's role as a container. The tree anchors one end of this facade; an original artwork by Public occupies the other end. The art subtly tells the story of the house and family through pictographs cut into a vertical steel band.

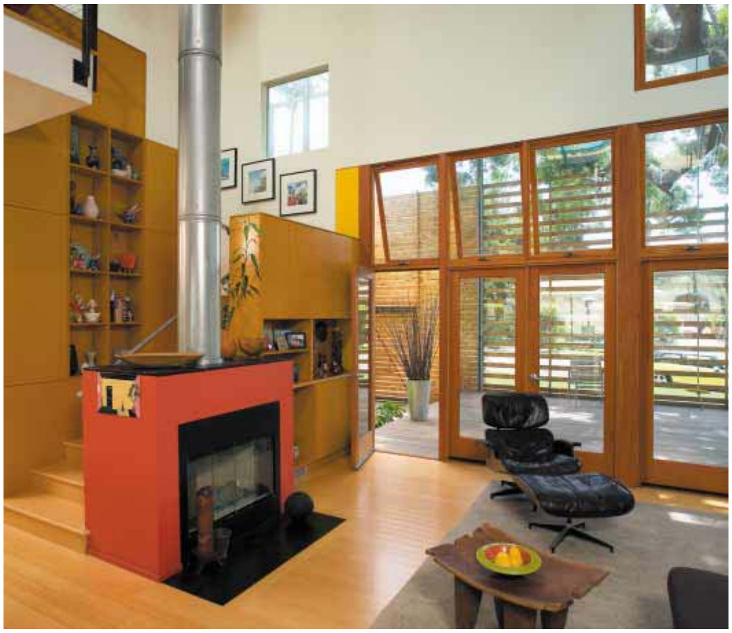
Inside the house, the renovation is divided into three zones: a 22-foot-tall volume containing the main living/dining area; a wide, central stair, efficiently lined with shelving and cabinets that leads to a second-floor study; and bedrooms, where a pair of children's rooms is

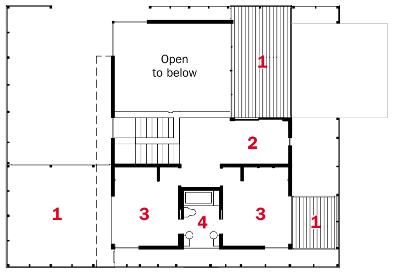
Ann Jarmusch is architecture critic of The San Diego Union-Tribune.

PHOTOGRAPHY: © DAVID HEWITT ANNE GARRISON ARCHITECTURAL PHOTOGRAPHY



The slatted-wood screens not only provide privacy, but modulate the light that flows into the interior spaces of the house. They also provide a welcoming yet clear-cut boundary between the indoor and outdoor living spaces of the home.



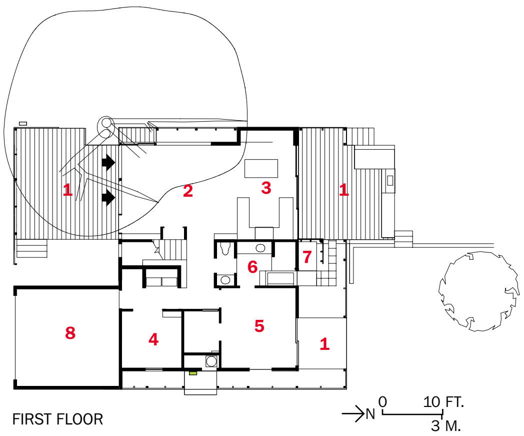


SECOND FLOOR

1. *Deck*
2. *Loft/office*
3. *Bedroom*
4. *Bath*

stacked above the master bedroom and a den/guest room. Remarkably, every living space and bedroom opens onto an outdoor room.

The airy, front space that invites the tree "inside" flows without interruption, sweeping from a casual living room to a dining area and adjoining kitchen. The kitchen, in turn, overlooks the rear deck and yard. Plans call for this deck to be screened like the front one. Both ends of this living/dining volume are glazed with doors and windows, so the house seems to melt into outdoor rooms gently contained by the screen. Public's renovation not only makes the house feel larger than it is; in this temperate climate, it actually expands and diversifies the livable space available year-round and for years to come. ■



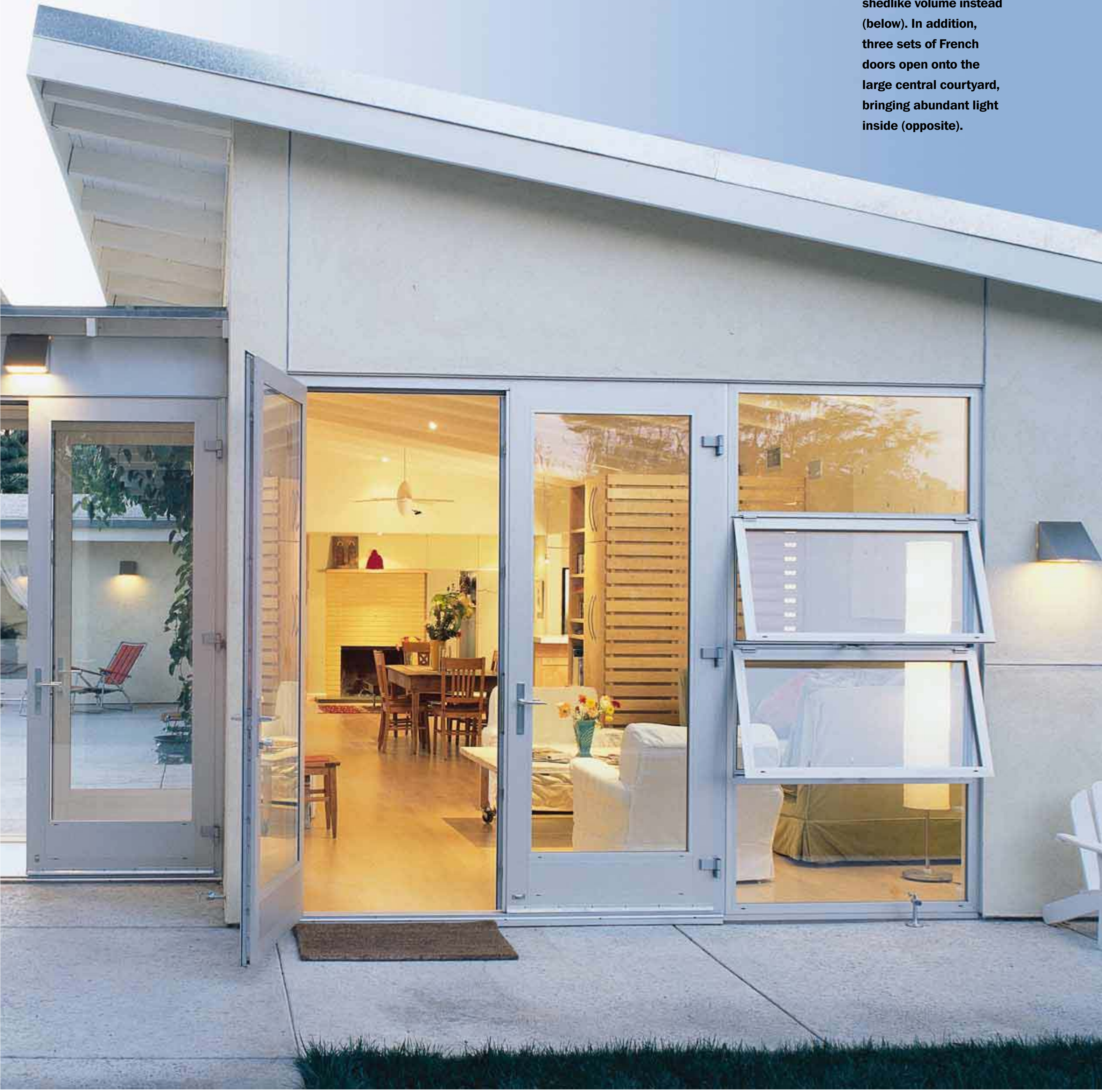
FIRST FLOOR

1. *Deck*
2. *Living room*
3. *Kitchen*
4. *Den*
5. *Master bedroom*
6. *Master bath*
7. *Outdoor shower*
8. *Garage*

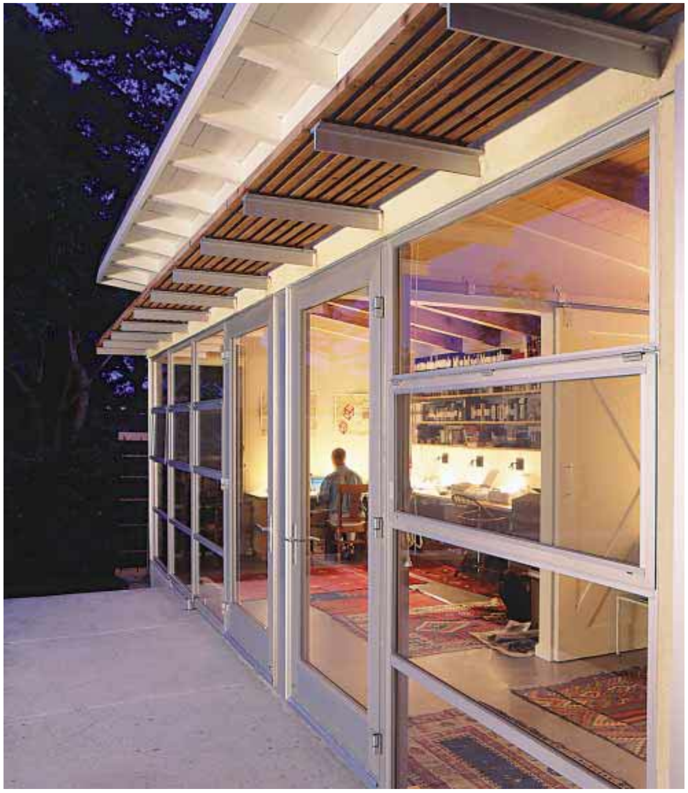
Project: *Lee Tree House, Bird Rock, La Jolla, Calif.*
Architect: *Public—James Brown and James Gates, partners in charge; Francisco Garcia, project manager; Steve Rosenstein, Alexandra Union, Daniella DeAlmeida, project team*
Consultants: *Envision Engineering, (structural engineer); Salehi & Salehi (energy)*
General contractor: *Public*

Sources
Structural framing: *Silverline Construction*
Exterior screening: *Industrial Arts (metal); Eric Nation (wood)*
Roofing: *Gula Roofing*
Windows: *Woodmaster (wood); Window Master (aluminum)*
Doors: *Woodmaster (wood); Fleetwood Doors (sliding aluminum)*
Hardware: *Schlage*
Paint: *Wayne Klump Painting*
Tile: *Carter Glass Tile*
Story panel fabricator/designer: *Francisco Garcia*

For more information on this project, go to Residential at **www.archrecord.com**.



The architect removed the pitched roof of the existing 1950s ranch house and created a shedlike volume instead (below). In addition, three sets of French doors open onto the large central courtyard, bringing abundant light inside (opposite).



A neglected 1950s **Santa Barbara ranch house** comes back to life with help from Nick Noyes Architecture

By Allison Milionis

When the clients of San Francisco architect Nick Noyes relocated to Santa Barbara from Brooklyn, New York, they were eager to assume the Southern California lifestyle. In search of an affordable suburban home in a good school district, the family found itself driving through the Mission Canyon neighborhoods just minutes out of town, which enjoy spectacular views at nearly every bend.

While not in a typical suburb, winding Chaltenham Road hosts a line of modest homes fitted snugly on lots bursting with bougainvillea and night jasmine. The client's find, a 1956 ranch house, was woefully neglected and clearly out of sync with the site, but the family saw potential. Rather than tear down and rebuild, they opted to renovate and add onto the original 1,450-square-foot residence. "The house featured a cookie-cutter design and had no relationship with the site," says Noyes. "It required a radical intervention."

The first thing Noyes did—following repairs on the foundation, plumbing, and electrical system—was to remove two small rooms at the east end of the house, creating a long open space. This serves as the living and dining area, an informal linear gathering place to mediate surrounding interior and exterior spaces. Noyes dubbed it the "town square." "The family is very close, so making a central space where they can interact while going about their day was really important to them," he says.

They are also very creative—he is a filmmaker, she an artist. Noyes allowed room for the family's artistic activities, but only after establishing the building's formal clarity in plan and parti, further reinforced by the use of simple materials such as Sheetrock, clear anodized aluminum windows and doors, modest details, and a wood-framed structure. Reveals incorporated into the walls give the owners a composition of blank "canvases" on which to explore color and texture. Noyes jokes that the fireplace and surrounding wall have changed color a couple of times since the family moved in. "I wanted to create a backdrop for them, not dictate how they live in the house," he says.

A sliding barn door along the interior wall of the dining area cleverly conceals a built-in desk/work area where the family conducts business, and a sculptural bookcase and audio closet screen the entrance to the daughter's bedroom and bath. If the central space exists as the soul of the house, the adjacent kitchen might be the heart, as it is here that the family members share their passion for cooking and good food. Only 110 square feet, the space resembles an efficient triangle—stainless-steel sink, stove, and composite countertop—backed by an island that doubles as a bar for less formal dining.

The master suite is located at the front of the house and is surprisingly private. Formerly a living room that also served as the main

Allison Milionis is a freelance writer living in Los Angeles. She writes on architecture and design for several magazines, and frequently contributes reviews and narrative essays to local publications.

Project: *Santa Barbara Residence, Santa Barbara, Calif.*
Architect: *Nick Noyes Architecture—Nick Noyes, principal; Scott Baltimore, design team*
Engineer: *Howard & Van Sande*
General contractor: *W.A. Below General Contractor*

PHOTOGRAPHY: © J.D. PETERSON PHOTOGRAPHY

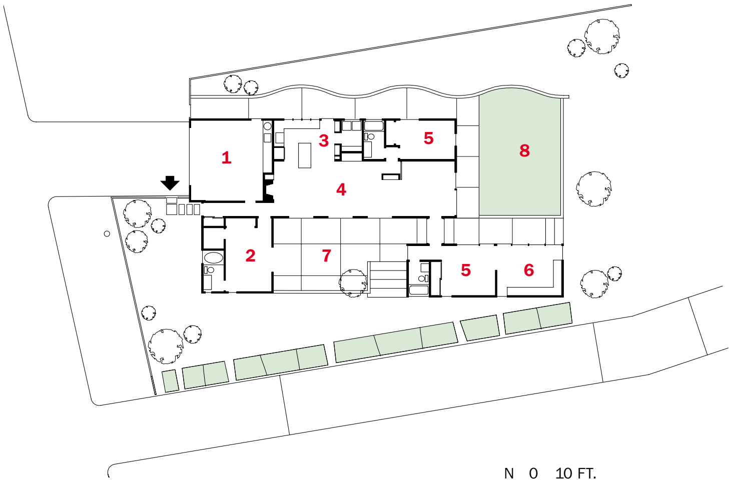
Exposed ceiling beams, structural columns, and a sliding barn door that hides a work area define the character of the main living/dining space, which acts as a hub for gathering and family activity.

entrance to the house, the suite features an interior wall lined with closets, a bathroom, and a set of French doors that open to the courtyard. Not only does this alteration define the room, it also clearly marks the main entrance and entry hall.

Adjacent to the master suite, the architect sited an artist's studio, formerly an attached, two-car garage. Noyes installed three skylights and a frosted-glass roll-up door to bring in as much natural light as possible and establish an indoor-outdoor relationship for the erstwhile New York painter.

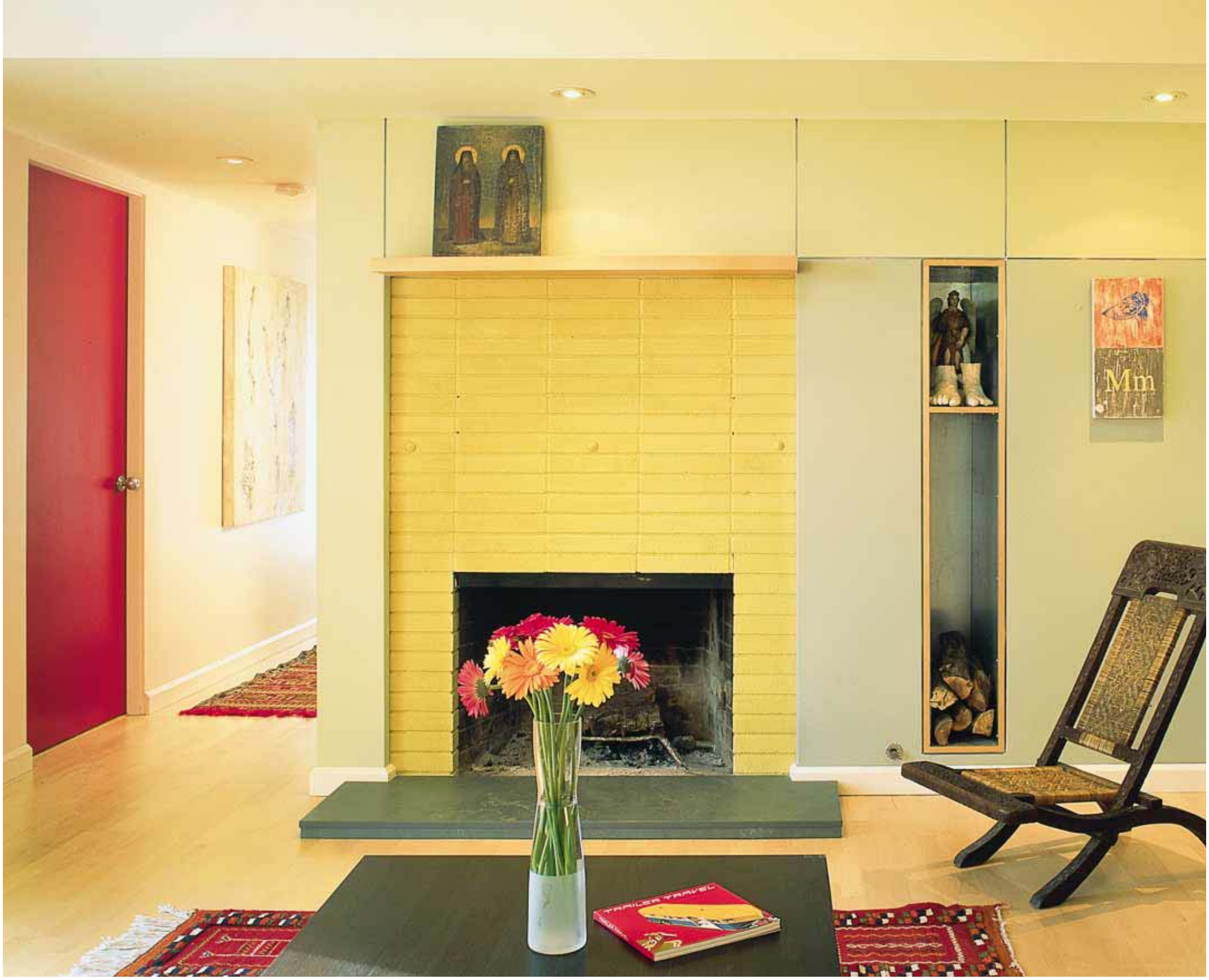
To create volume in the central space, the pitched ceiling was cut essentially in half and converted into a shed roof. Noyes installed three sets of French doors, topped by clerestory windows that open onto the large central courtyard. Another set of doors and awning windows at the east end of the space opens to a small terraced backyard and play area. "In a sense," says Noyes, "the house turns inward on itself and outward at the same time."

The 525-square-foot addition at the back, which accommodates an office, guest bedroom, and bath, helps define the edge of the yard. Noyes explains that the original concept was to build a two-story "tower" with unobstructed views of the Pacific Ocean to the west. But the neigh-

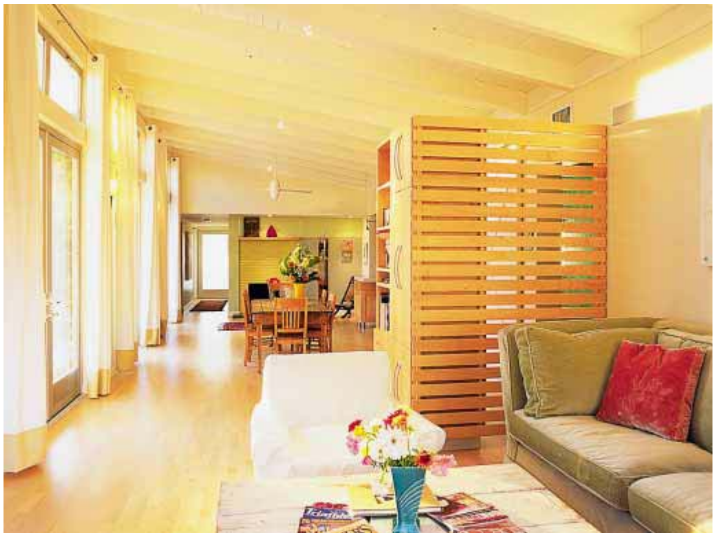


SITE/FLOOR PLAN

1. *Studio (former garage)*
2. *Master suite*
3. *Kitchen*
4. *Living/dining room*
5. *Bedroom*
6. *Office*
7. *Terrace*
8. *Lawn*



Reveals set into the Sheetrock walls around the fireplace provide the homeowners a place to explore their love of color (above). A bookcase and audio closet screen the entrance to the daughter's bedroom and bath (below).



bors weren't fond of the idea, so Noyes did the next best thing: He tilted the tower on its side and oriented a wall of commercial glazing (purchased from a company that fabricates storefronts) toward the northeast for views of the Santa Ynez mountain range. The addition complies stylistically with the main house, mirroring the shed roof, materials palette, and even the sliding barn door. The only variation is the concrete flooring, which the clients had considered for the main house before determining it was too austere for their taste.

Perhaps one of the biggest compliments paid to Noyes is from the children who come to see the owners' daughter. "I've been told that kids ask to come over to the house to play because they like how open it is," he says. Indeed, a world away from their East Coast urban origins, this family has realized what many others have come to California in search of: a balmy climate, pleasant neighborhood, and a home that reflects an inspired lifestyle. ■

Sources

Windows and doors: *Metal Window Corporation*

Locksets: *Schlage*

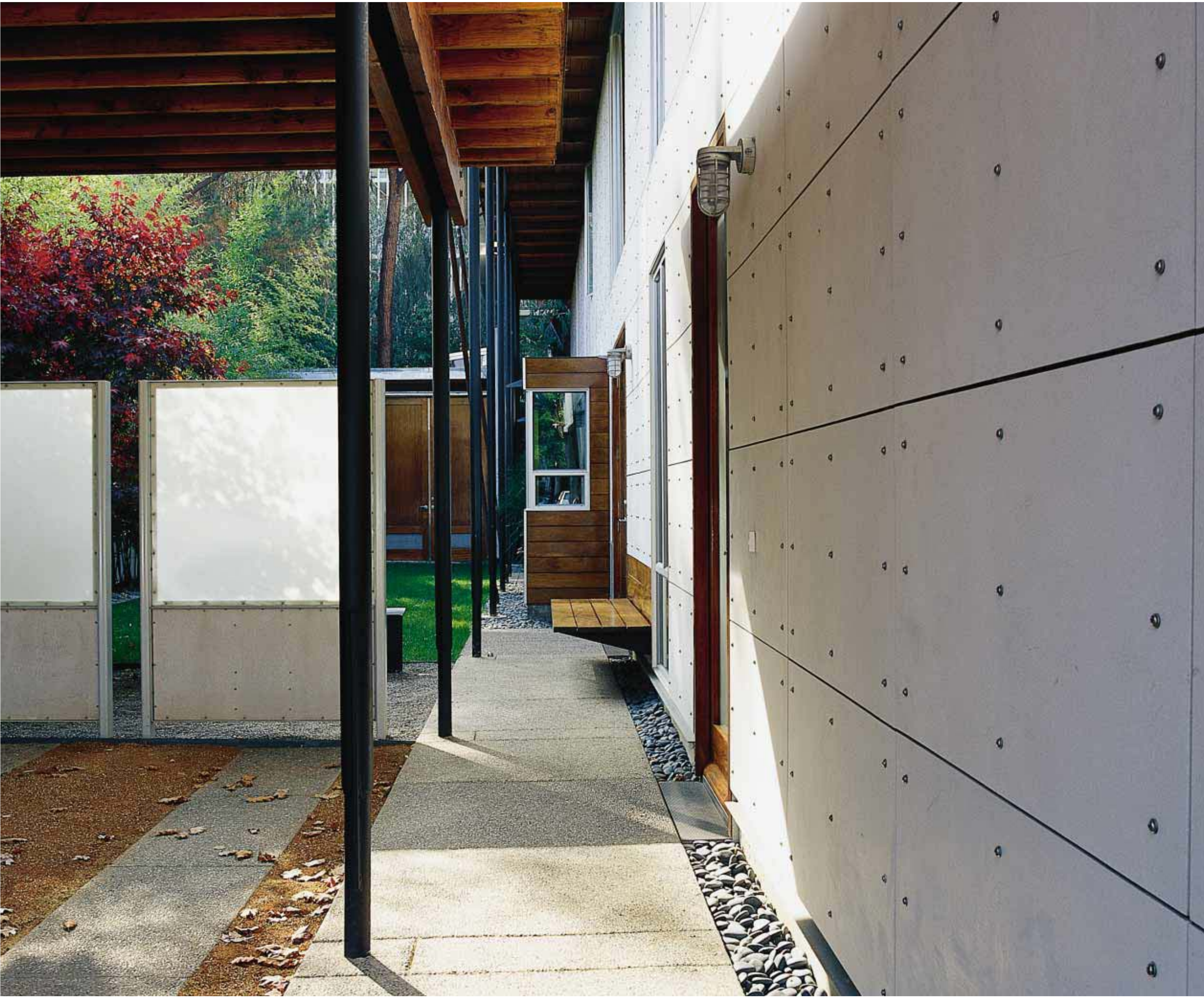
Countertops: *Ceasarstone (plastic laminate)*

Bath tiles: *Ann Sacks*

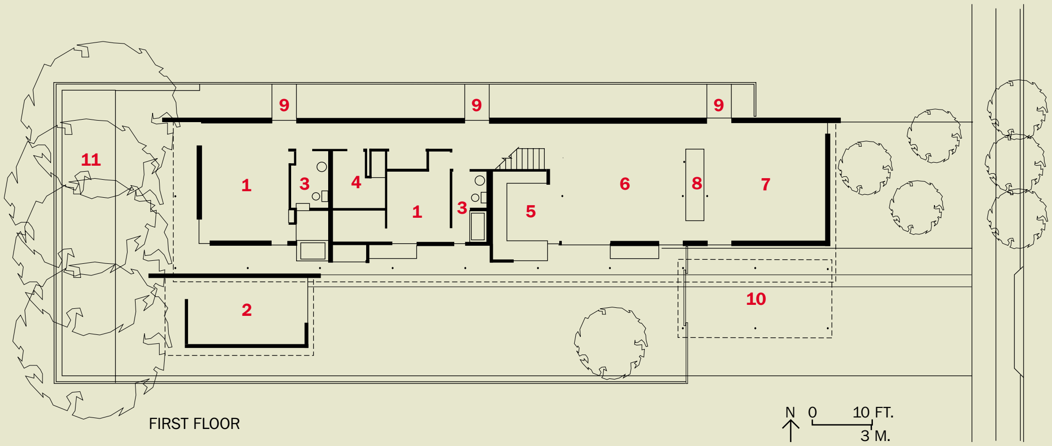
Lighting: *Shaper (exterior downlights); Leviton (controls)*

Plumbing: *Duravit (fixtures)*

For more information on this project, go to Residential at **www.archrecord.com**.



The main entrance to the house is framed by an open carport on one side and the two-story residence on the other (above). These scales create a seamless transition from the low-scaled bungalow next door to the apartment building on the other side (opposite).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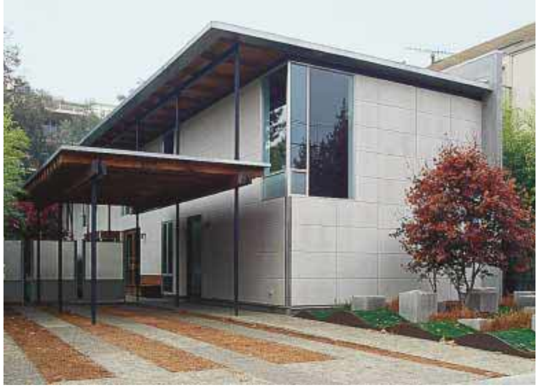
David Baker + Partners' house at **310 Waverley Street** redefines the character of the neighborhood

By John King

PHOTOGRAPHY: MASSIMILIANO BOLZONELLA, COURTESY DAVID BAKER + PARTNERS, ARCHITECTS



Like many affluent, settled communities, Palo Alto likes to keep architects on a short leash—reining them in with design reviews and public hearings to guard the city's self-image as the cultured heart of Silicon Valley. So how did Scott Ward's unabashedly Modern house, with its boxy shape and concrete-board walls, find its way onto a block lined largely with 1920s bungalows? A zoning loophole, which was slammed shut after nearby homeowners saw their austere new neighbor, allowed the project to go through.

The 2,729-square-foot structure that architect David Baker compares to "an elegant warehouse" occupies a lot that has a single-family home on one side and a four-story-high condominium complex on the other. When Ward purchased the lot in 1997, it was zoned for a duplex, and anything smaller required nothing but a quick check of the plans at the permit department. The trouble started as the spare creation rose, including a front wall that lacks a door, a porch, or any obvious domestic touch. Ward was accused of building something that looked like a bank or worse; one neighbor even called in the police when bamboo was being planted.

These days, though, the house that Ward occupies with his partner, May Lawrence, and his 14-year-old son, Brendan, feels placid and refined, not provocative at all. Maple trees soften the view from the sidewalk, and the once-controversial bamboo now forms a gentle hedge. Call it cutting-edge contextualism: proof that a contemporary home can settle in among older neighbors on its own terms, without rattling cages.

The core of Baker's design isn't architectural so much as conceptual: In essence, he sliced the deep lot into two thin pieces that run from Waverley Street to the lot's rear fence, and then lined things up to segue smoothly from one neighbor's scale to the next. The portion of the lot that abuts the next-door bungalow is largely open, with a grassy courtyard tucked behind a carport, while Ward's house fills the other side with a narrow box, 20 feet wide, 20 feet high, and 104 feet deep. Compared to a bungalow, the scale is undeniably big—but along the courtyard, the house shifts from solid to void, with the flat roof extending out 5 feet beyond the walls. The scale drops even more sharply as the house gives way to the carport, a spare composition of steel columns and a thin wood roof. And while the height of the house exceeds the steep peak of the pitched roof next door, the carport doesn't even reach the top of the bungalow's front windows.

The shell of the house is conventional wood frame construction, but the outer walls are then clad in panels made of Eternit, a mix of sawdust and concrete, with raised bolts to keep things from looking too slick.

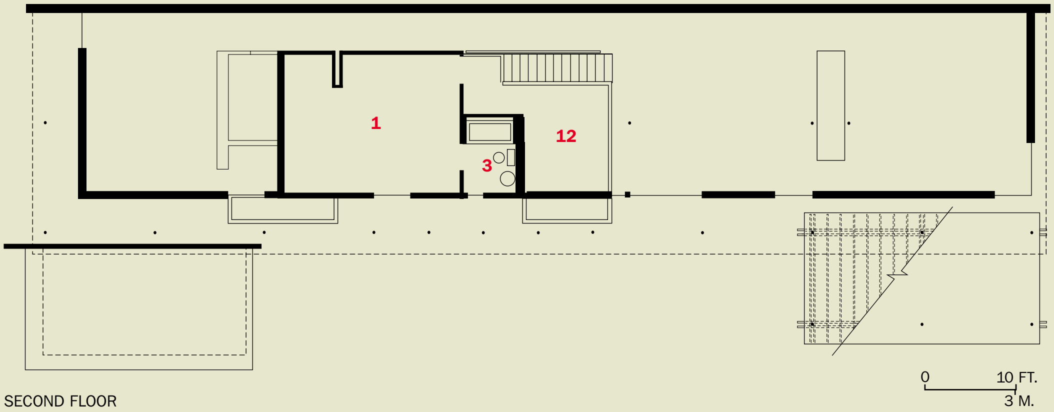
John King is the urban design critic for the San Francisco Chronicle.

Project: *310 Waverley Residence, Palo Alto, Calif.*

Architect: *David Baker + Partners, Architects—David Baker, FAIA, principal/project architect; Jeff Burris, job captain; Jane Martin, project team*

Consultants: *Andrea Cochran Landscape Architecture (landscape); Your Space Interiors (interiors)*

General contractor: *Devcon Construction*



SECOND FLOOR

1. *Bedroom*
2. *Studio*
3. *Bathroom*
4. *Closet*
5. *Kitchen*
6. *Great room*
7. *Living room*
8. *Fireplace*
9. *Water installation*
10. *Carport*
11. *Garden*
12. *Office*

Steel columns and beams define the loft-like front of the house, which includes double-height social spaces and kitchen (this page, top and bottom left, and opposite). Custom steel stairs lead to a bedroom upstairs (below).

And the frame of slender steel columns is left exposed, as though a ghost of scaffolds remained in place. "It's a very Japanese type of house," Baker suggests. "The materials are natural, and we're celebrating texture. It doesn't matter if there are imperfections." As for the sacrifice of private space behind the lot for a slender courtyard visible from the street, he notes, "It just seemed so nice there. Backyards are part of the suburbanism we were trying to avoid."

The interior of the house has a loftlike feel befitting Ward's grudging retreat from city life when he moved south from San Francisco to raise his son. The front half forms a single cavernous volume that includes social spaces, a kitchen, and a small work area on the mezzanine. Two small bedrooms stacked atop each other and the master suite are sited at the back of the house—privacy secured by an 18-foot-high translucent door that weighs 300 pounds and rolls slowly into place.

Not all the neighbors are won over, but many have come around. And they aren't the only ones. "Some people are effusive; they tell us how much they love it or leave notes taped to the window," Lawrence says. "One real estate agent wrote us saying some kid from Google wants to buy the house. We tear up these notes." ■

Sources

Exterior: *Eternit*

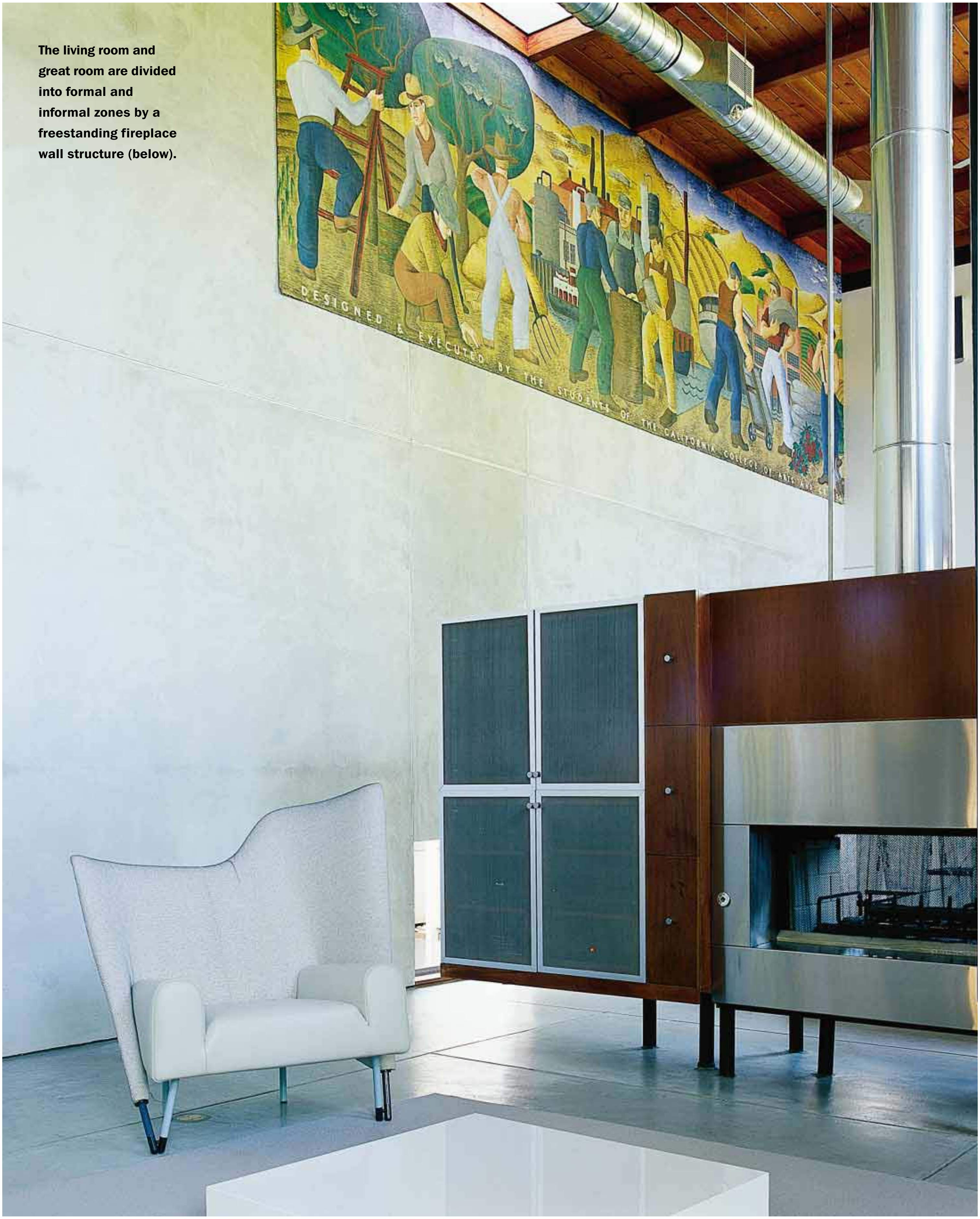
Appliances: *Bosch; KitchenAid; Dynasty; Thermador*

Fixtures: *Moen; Kroin; Hansgrohe (Starck)*

Bath: *Ideal Standard; Just Manufacture; Eljer (toilet); American Standard (bathtub); Chiaro (tile)*

Lighting: *Lightolier; Seagul; Halo Prudential Lighting*

For more information on this project, go to Residential at **www.archrecord.com**.


DESIGNED & EXECUTED BY THE STUDENTS OF THE CALIFORNIA COLLEGE OF ARTS AND

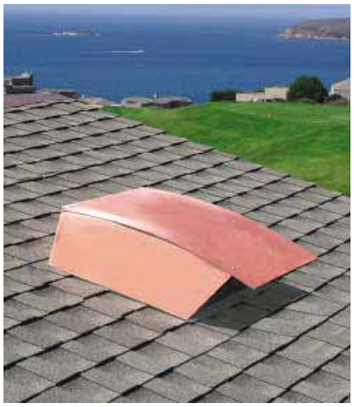
The living room and great room are divided into formal and informal zones by a freestanding fireplace wall structure (below).

Residential Products California Selections

▼ Exclusive quartz surface line

Embellish is CaesarStone's first line of quartz surfaces created exclusively for architects and designers. Inspired by Italian designer and color expert Roberto Cannovaro, the collection includes Tequila Sunrise (bright orange), Apple Martini (apple green, below), Rosemary (greenish gray), Mocha (coffee-brown), Brick (deep, dark red), Cinder (light gray), Cement (darker gray), and Iceberg (eggshell). Ranging in price from $50 to $80 per square foot, the surfaces are resistant to heat, cold, mold, mildew, stains, chips, and scratches. CaesarStone, Sun Valley, Calif. www.caesarstoneus.com **CIRCLE 200**

McGuire has collaborated with interior designer Thomas Pheasant for its latest furniture collection of living-room, dining-room, and occasional pieces in a mix of materials including rattan, rattan core, leather, cast bronze, glass, and stone. The dining armchair in woven core or woven leather (left) features an upholstered back and fitted pillow, while the rattan cocktail table with tray (below) has cast-bronze legs and an upholstered cushion. McGuire, San Francisco. www.mcguirefurniture.com **CIRCLE 203**



◄ Quieter ventilator

Abbaka has introduced its "hyper quiet," low-profile, exterior ventilator series, Hy-Ex. The 1400 CFM ventilator produces no more than 60 decibels of ambient white noise (comparable to a window air conditioner). The ventilator is 9" at its peak, in a "millennium curve" design dipping to 7". Decorative finishes include metallic, weathered copper, or bronze, and a range of custom colors in powder-coated epoxy enamels. Abbaka, San Francisco. www.abbaka.com **CIRCLE 201**

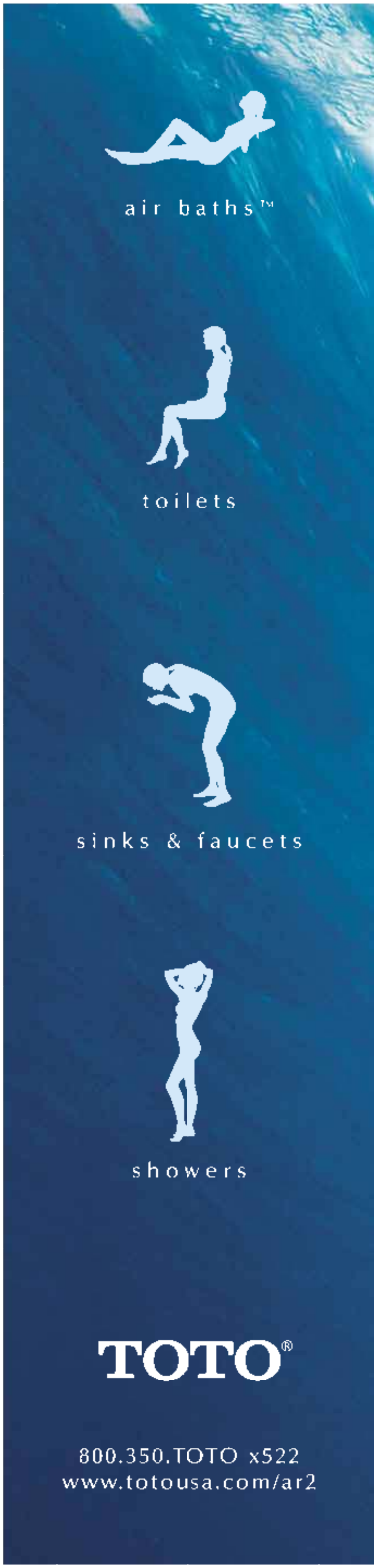
► What's next in laundry

Bosch has built on its front-loading Nexxt laundry line with the addition of the Nexxt Essence washer, which premiered at this year's Kitchen & Bath Industry Show in Las Vegas. With its Sensotronic Plus wash system, the washer digitally monitors and maintains water temperatures for 15 different washing programs. Another addition to the Nexxt laundry line is the Nexxt Liquid Propane Gas Dryer. This model features the same performance as the Nexxt gas dryer but uses liquid propane instead of natural gas. BSH Home Appliances, Huntington Beach, Calif. www.boschappliances.com **CIRCLE 202**

▲ Lux Italian-designed kitchens

Terra (above), one of two new kitchen models from Snaidero, is available in brandy- and dark-oak wood, and features fingerprint-resistant stainless-steel shelves, a backlit electronic control panel, cabinet drawers with an illuminated, recessed channel, and a slim hood design with integrated lighting effects. The Vela kitchen, also new, features alternating light and dark colors in the worktop and doors and floating shelves that create a Modern profile, offset by translucent glass doors and soft recessed lighting. Snaidero USA, Los Angeles. www.snaidero-usa.com **CIRCLE 204**

For more information, circle item numbers on Reader Service Card or go to www.archrecord.com, under Products, then Reader Service.



▼► Five decades old and going strong

Thermador is celebrating its 50th anniversary this year and launched a range of new products to celebrate. The Pro Harmony, a 24"-deep Professional Series Range that offers a fully flush design for any size kitchen, is the latest addition to Thermador's advanced Professional Series collection, which includes a line of 27"-deep ranges and cooktops. Pro Harmony features a control panel outfitted with "True Blue" colored knobs, a revival of Thermador's classic 1955 knob design. Also new from Thermador is the HD nine-program dishwasher available with Professional handles (below), which can be fully integrated into existing cabinetry. Thermador, Huntington Beach, Calif. www.thermador.com **CIRCLE 205**

► Californian dreaming

Architect Jacek Ostoya and architectural woodworker Peter Brayshaw run Mebel Furniture out of a design office in California, while the pieces are actually manufactured in Connecticut. The two brothers-in-law formed the company in 2003 with the goal of crafting furniture that would blur the line between work and play. This past May, they exhibited at ICFF with 12 other California designers under the banner of Left Edge: State of California Design, a first-time California Pavilion at the show. Mebel's Lubin line features pieces that are weighty and sculptural wood slabs, intersected by the lines of brushed-stainless-steel legs and wool cushions. All pieces are available in either natural maple, natural walnut, or stained walnut. The Lubin daybed (above) doubles as a coffee table with its cushions removed—which in turn can serve as floor seating around the table. Mebel Furniture, San Francisco. www.mebelfurniture.com **CIRCLE 206**

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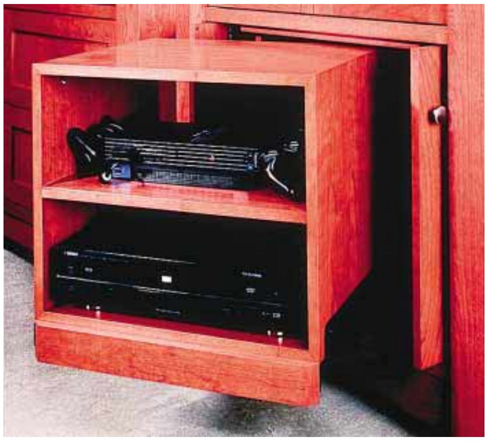
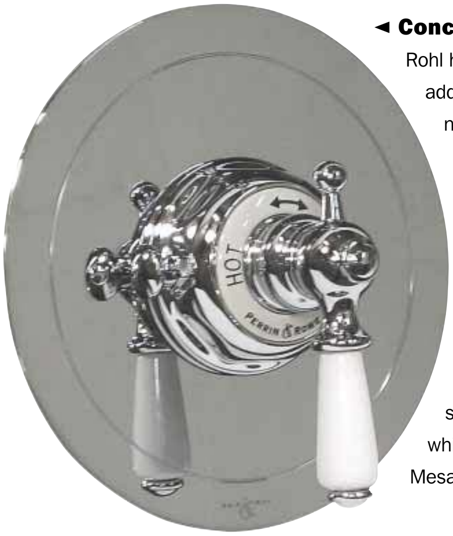
► Wiring access system

Accuride has introduced a smaller capacity Media Access Center (M.A.C.) designed for home entertainment or commercial applications. The product eliminates the hassle when setting up media equipment by offering easy access to component wiring and is intended as a complete solution for cabinetry designed to contain computer or electronic components of all varieties. The M.A.C. 50 is a single swivel assembly mounted to slides that is installed at the bottom of a cabinet. It carries shelving units 20¾" wide by 18" deep, and up to 36" tall, and has a load rating of 150 pounds. Accuride, Santa Fe Springs, Calif. www.accuride.com **CIRCLE 207**





◄ Concealed thermostatic trim sets

Rohl has expanded its Perrin & Rowe bath collection with the addition of two Concealed Thermostatic Trim Sets. Both new styles, oval and round plate (left), complement traditional and contemporary shower decor. The oval plated U.5521X (cross handles) or U.5520L (lever) include volume control and temperature control, while the round plated U.5565L (lever) or U.5566X (cross handles) feature temperature control only. Available in Perrin & Rowe's English bronze finish, as well as polished chrome, polished nickel, satin nickel, and Inca brass, the trim sets are crafted in the United Kingdom from solid brass and plated with a 25-micron-thick finishing, which is three times the industry standard. Rohl, Costa Mesa, Calif. www.rohlhome.com **CIRCLE 208**

► Cinema-worthy projector

Vidikron, a producer of high-definition home-theater video displays, has further enhanced its flagship projector, the Vision Model 100, by incorporating CineWide with AutoScope technology. The Vision Model 100 is a three-chip high-light-output DLP projector that uses Vidrikon's LightAmp engine to create bright and detailed pictures, even high-ambient-light situations such as family and living rooms. For the first time, Vidikron combines proprietary image processing and cinema-grade custom lens optics to show movies filmed in the Cinemascope 2.35:1 aspect ratio with constant vertical height. CineWide eliminates black stripes on the top and bottom of the screen while preserving all of the resolution available from the display's chips, and the motorized AutoScope lens assembly allows viewers to switch to the new, extra-wide viewing mode with a single remote-control button. Vidikron, Union City, Calif. www.vidikron.com **CIRCLE 209**

For more information, circle item numbers on Reader Service Card or go to www.archrecord.com, under Products, then Reader Service.

Products

Wood & Resilient Flooring

In **wood and resilient flooring** news, the Wood Flooring Information Initiative has been developed to provide timely info about the U.S. wood flooring industry, while the Resilient Floor Covering Institute's new FloorScore program identifies products that meet **stringent IAQ requirements**. *Rita Catinella Orrell*

Finished cork tiles for residential and commercial applications

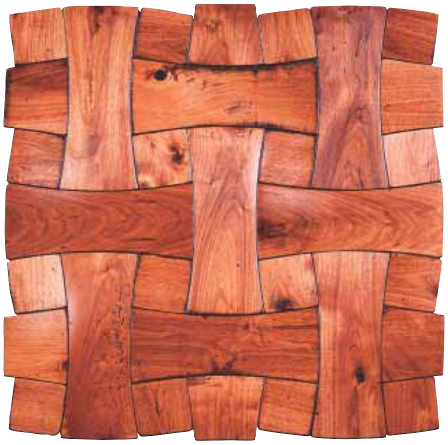
Cork Concepts specializes in Cortica high-density ¼"-thick agglomerated cork floor modules with waterborne polyurethane in natural, colored, and metallic finishes. All finishes are completely water-resistant and suitable for kitchens, bathrooms, and laundry areas in single- or multifamily homes. Commercial applications include banks, corporate offices, retail spaces, and schools. The natural cork tiles are biodegradable, nonallergenic, sound and thermal insulating, and nontoxic.

Cork is a renewable resource that is harvested every nine years from the cork oak tree. All of the cork harvested for Cortica is gathered from waste generated from the production of wine stoppers.

Cortica's color is integral with the waterborne polyurethane finish—the tiles are not baked to the point that the cells begin to lose their natural thermal and acoustic benefits. Tiles leave the manufacturer with three coats of preapplied finish, while an additional one to two clear coats are applied after installation. The urethane finish is the same coating used on hardwood flooring and is suitable for commercial installations.

The tiles will fade if installed in areas that receive direct or intense sunlight. Cortica color offerings have more protection from fading than the neutrals, due to the pigments in the urethane. While some cork tiles grow after being removed from the cartons, Cortina tiles do not since they are allowed to stabilize for a longer period of time prior to installation, and the tiles' beveled edges eliminate the visual differences created by the natural air cells in the cork. No chemicals are needed to clean the tiles; just hot water for routine cleaning or lemon juice and hot water or mineral spirits for a grease or oil-based spot. Renewable Sources, Portland, Ore.
www.corkconcepts.com
CIRCLE 210

Cortica tiles are completely water-resistant.



Hardwood flooring that avoids straight edges

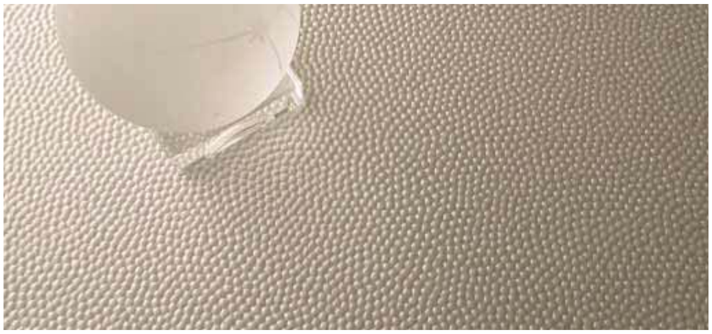
Ouila, part of Richard-Marshall Fine Flooring's Olde Boards European collection, is 100 percent "curved," handcrafted hardwood flooring. Absent of any straight lines, the flooring was originally designed for a high-profile client of Los Angeles designer Dalton Robertson, and has been well received in the custom-home market, according to the manufacturer. Ouila is produced at the company's 104,000-square-foot Los Angeles manufacturing facility. The boards are not finished with polyurethane. Instead, Chinese tung oil is hand-rubbed into the wood to bring out its natural luster and sheen. The woods, including walnut, quartered oak, maple, cherry, pecan, and pine, are purchased from growers committed to replanting their trees, and no rain forest woods are used in the production of the product. In addition to high-end homes, the flooring has been installed in commercial projects such as hotels and country clubs. Richard-Marshall Fine Flooring, Hawthorne, Calif.
www.oldeboards.com **CIRCLE 211**

Resilient vinyl with a gemlike surface

LonBead resilient vinyl flooring, from Lonseal Flooring, features a luminescent embossed surface available in eight colorways that change according to the viewer's angle. The skid-resistant surface features subtle hints of iridescent hues with minute flakes and fibers embedded into the sphere of each bead.

LonBead is the latest addition to Lonseal's GreenAir Collection of low-VOC-emitting resilient vinyl products, and features up to 20 percent reused-materials content.

Lonseal has earned GreenGuard Environmental Institute's GreenGuard Indoor Air Quality Certification for several vinyl flooring products, and will continue to be monitored by GreenGuard on an ongoing basis. Lonseal Flooring, Carson, Calif.
www.lonseal.com **CIRCLE 212**



The flooring features iridescent hues and low VOCs.

Products Wood & Resilient Flooring

▼ Safety flooring without the sparkle

Altro Maxis Suprema slip-resistant sheet floor has the safety and hygiene benefits of Altro's other products without the allover sparkle usually associated with safety flooring. Instead, the flooring has a transparent finish that creates an impression of depth. Available in 12 contemporary colors, the product incorporates Altro EasyClean Maxis technology that improves dirt and stain-resistance, color retention, and cleanability, as well as AltroSan integral bacteriostat, which helps prevent the spread of bacteria. Altro, Mississauga, Ontario. www.altrofloors.com **CIRCLE 213**

▼ Certified solid oak flooring

Earlier this year, Smith Flooring completed its first run of FSC-certified oak flooring since achieving Chain-of-Custody certification from the Forest Stewardship Council (FSC) in 2004. The flooring is produced from trees grown in a privately held forest in Missouri's Ozark Mountains. According to the FSC, there are fewer than 12 certified flooring manufacturers in North America supplying certified solid oak. Smith Flooring is the largest producer overall. Smith Flooring, Mountain View, Mo. www.smithflooring.com **CIRCLE 215**

► Breathe easier

Ultrabond ECO 972 is the latest in Mapei's ECO series of environmentally friendly floor-covering adhesives that are low in VOCs. The formula was developed for the installation of engineered wood and parquet flooring. Ultrabond incorporates Mapei's BioBlock antimicrobial technology to provide an additional line of defense by inhibiting the growth of odor- and stain-producing mold, mildew, and bacteria. Mapei, Deerfield Beach, Fla. www.mapei.com **CIRCLE 217**

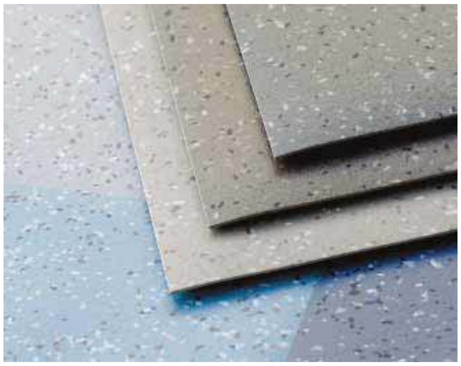
▲► Wider and more colorful

Junckers Hardwood introduces five "custom" colors to its Olde World Collection of antique sculpted hardwood flooring. Sienna (above left), one color in the collection, features both medium red and brown tones. Junckers has also introduced its first wide-plank engineered product line, the Woodland Collection. The 14 products in the collection are divided into two offerings, ½" smooth surface and ¾" hand-scraped products. Peruvian Walnut-Designer's Touch (above right) has a color similar to Peruvian Walnut, with the exception of blonde figuring. Junckers Hardwood, Anaheim, Calif. www.junckershardwood.com **CIRCLE 214**

◄ Expanding palette

Created by Amtico's design team, Color Zone (left) offers a new palette of nine subtle shades. Specifiers can choose any one of nine color options and then customize it by adding a sparkle (MicroSpec) or selecting a finish such as press plate, rib, or a 3D effect. Amtico's Amtico and Stratica flooring brands have met the requirements of the new FloorScore testing program, a voluntary certification program that identifies flooring products that meet stringent air-quality requirements. Amtico, New York City. www.amtico.com **CIRCLE 216**

► Flooring déja vù



Relay sheet flooring is manufactured using 40 percent preconsumer (postindustrial) recycled content. The scrap material is sent through a grinding process that produces a mixture of fluff from the carpet face and chunks from the carpet backing. The mixture is heated and pressurized into cord-shaped pieces that are colored and ground into chips, which are used in place of virgin raw materials to produce color pellets for Relay. Mannington Commercial, Calhoun, Ga. www.mannington.com **CIRCLE 218**

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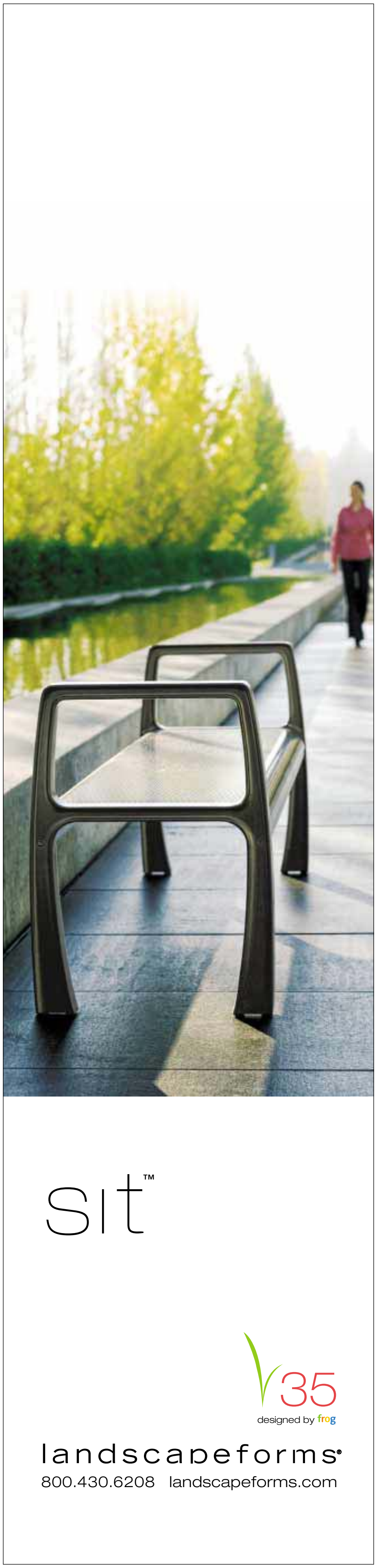

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Products Wood & Resilient Flooring

◄ Rubber flooring revelations

Freudenberg Building Systems has introduced several new rubber flooring products this year, including noraplan fossil (left) and norament 925 grano FS (below). Noraplan fossil is characterized by color granules that resemble fossil inclusions found in nature. The multicolored granules are embedded in one of 16 base colors that supplement the existing noraplan range. The floor's smooth, nonglare finish reinforces the natural look of the line, making noraplan fossil a good complement to wood, stone, and other natural design elements. Norament 925 grano FS is a rubber floor covering that uses a low-emission releasable adhesive to facilitate installation, removal, and reinstallation of the flooring. It is particularly suited for installation on raised-access floors and areas with limited periods of use. Freudenberg Building Systems, Lawrence, Mass. www.norarubber.com **CIRCLE 219**

► Wood-look vinyl for retail environs

Armstrong's new Natural Creations vinyl tile Woods Collection is the first in a series of nature-inspired commercial flooring created specifically to meet the design needs of both specialty and mass retail environments. Available in an array of traditional, exotic, and rustic wood visuals, the collection combines the look of natural hardwood with the advantages of commercial resilient flooring. Thirty-four new designs (in 22 different species) feature a 20 mil solid vinyl wear layer that offers abrasion-resistance and ease of maintenance. The 36" planks feature beveled edges and are sized to 4", 6", or 8" widths. Armstrong World Industries, Lancaster, Pa. www.armstrong.com **CIRCLE 220**

◄ One material, many looks

Tarkett Commercial has launched a new collection of high-performance heterogeneous vinyl modular flooring called I.D. Moduline. Designed for retail, hospitality, health-care, and office applications, the line features wood and stone looks, bold geometric patterns, and contemporary aluminum effects. Several designs in the collection feature a 3D effect, giving the floor a depth accentuated with beveled edges on both planks and tiles. The floors are 100 percent recyclable and are manufactured using carefully selected, sustainable raw materials, many of which come from recycled sources. Tarkett Commercial, Houston. www.tarkett.com **CIRCLE 221**

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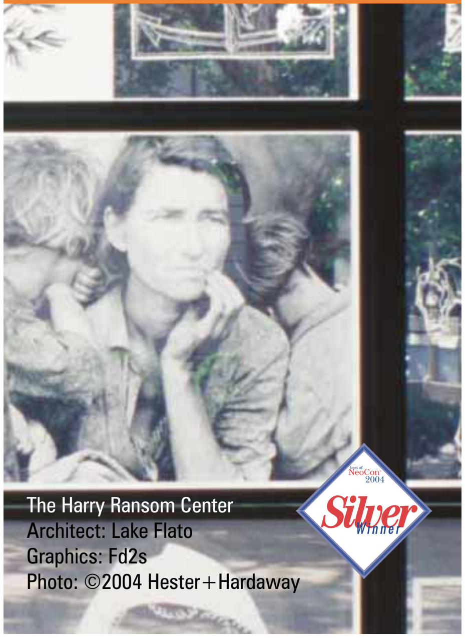

The Harry Ransom Center
Architect: Lake Flato
Graphics: Fd2s
Photo: ©2004 Hester+Hardaway

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► Bacteria-fighting flooring

FlexSafe antimicrobial protection flooring system signifies Flexco's rubber products, which are naturally resistant to mold and bacteria (meeting ASTM G-21 specifications), as well as Flexco's vinyl flooring, which has a built-in antimicrobial barrier to prevent the growth of mold and bacteria. It is an ideal choice for day-care centers, gymnasiums, classrooms, hospitals, and any other area where added hygiene is essential. Available in a broad range of products, the FlexSafe antimicrobial system tiles can be fused together with welding beads to create a one-piece, seamless floor for added protection against bacteria. Flexco, Tuscumbia, Ala. www.flexcofloors.com

CIRCLE 222

▼ Vinyl and cork slip-resistant tile

Roppe has recently added a solid vinyl tile to its SafeTcork product line. SafeTcork products are available in either rubber or vinyl, and contain a cork content that improves slip-resistance by 20 percent. An EcoEffect product, SafeTcork is manufactured using postindustrial waste cork, a renewable resource, and can contribute to LEED. SafeTcork's vinyl offering is a smooth finish tile available in six of Roppe's most popular colors with a coordinating white marbled design. A highly durable formulation of solid vinyl and cork, the tile is self-coving and self-waxing for easy maintenance and has life-cycle costs comparable to rubber. The flooring also features built-in antimicrobial agents, meeting ASTM G-21 standards. Roppe, Fostoria, Ohio. www.roppe.com

CIRCLE 223

► Wider plank size follows demand

Mirage North America has introduced 5"-wide planks for its Engineered flooring collection. The new, wider planks are intended to reflect current trends in hardwood flooring and are manufactured to meet growing consumer demand in both North America and Europe. The new plank widths are available in Exclusive Oak and Maple in a choice of Natural, Auburn, Nevada, or Sierra stains. Mirage plans to add more stain colors and finishes for 5" planks in the near future, including its Cashmere low-gloss finish. The planks complement a number of other product introductions this year, such as several new Engineered products, including dark purple Merlot and black Sambuca stains on Maple and Birch, and dark brown Java on Yellow Birch. Mirage, Saint-Georges, Quebec. www.miragefloors.com **CIRCLE 224**

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Product Briefs

▲ Contemporary heating

Chesney's, a supplier of antique and reproduction stone and marble fireplaces, has introduced the Jasper Conran Collection of contemporary fireplaces and fireplace accessories. Conran, the son of restaurateur/design guru Sir Terence Conran and best-selling writer Shirley Conran, has created a collection of three Modern, limestone mantels: Avignon, Meridian, and Totem. The mantels, and the accompanying steel firedogs, are meant for all types of interiors. Totem (left) features two totem-polelike pilasters that animate the surrounding slabs of limestone. Chesney's, New York City. www.chesneys-usa.com **CIRCLE 225**

► Grid-hiding/noise-absorbing

The clean visual of the Armstrong grid-hiding Vector edge detail is now available in high-acoustical-performance, high-light-reflectance Optima planks in large modules, including 2' x 8' sizes. The patented Vector edge detail produces a ¼" reveal that minimizes the visible grid. The planks feature a Noise Reduction Coefficient of 0.90 (they absorb 90 percent of surrounding sound) and a recycled content of 40 percent. Armstrong World Industries, Lancaster, Pa. www.armstrong.com/vector **CIRCLE 227**

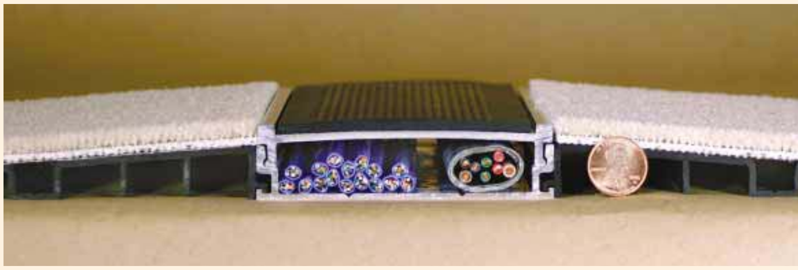
▼ PVC-free goal

Designtex has joined parent company Steelcase in announcing plans to completely eliminate PVC from its product offerings by 2012. The decision is part of an overall strategy to minimize the environmental impact of current materials and products while searching out alternative, sustainable materials to work with. In the following months, Designtex will launch over 20 new wall-covering products that have the performance and price of vinyl but without the PVC. Designtex, New York City. www.dtex.com **CIRCLE 228**

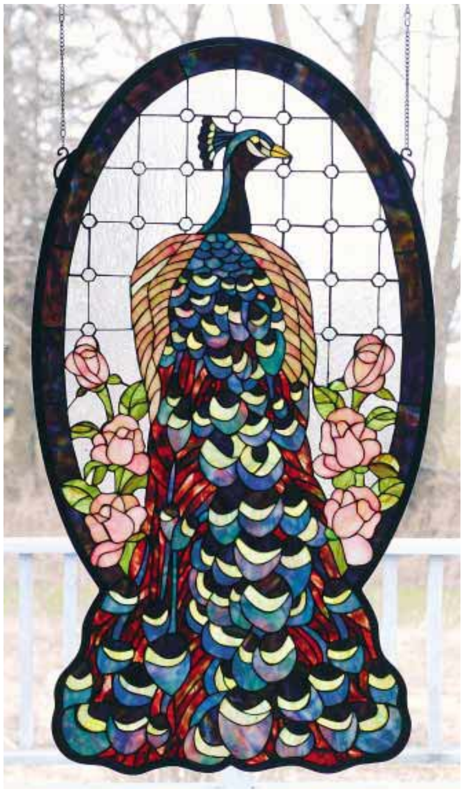
Product of the Month
connectrac

The patented connectrac floor raceway system, designed by architect Clint Strong, provides an alternative to commercial interior electrical connectivity—including traditional power poles, poke-throughs, raised flooring, and obstructive conventional floor raceways—by eliminating structural holes and layout limitations.

The system consists of a shallow track with a removable aluminum cap forming a rectangular conduit to encase electrical wires. This low-rise conduit is supported by low-sloping ramps along each side that cause only a gradual rise in the floor surface, reducing tripping hazards and providing ADA compliance. The floor covering in the room (typically broadloom carpet or carpet tile) extends up over the ramps and integrates with the aluminum conduit cap. The system modules also integrate with a variety of finish options, including a choice of 10 standard Roppe textured rubber extrusions. The product received a Best of NeoCon Silver Award in the Architectural Products category at the 2005 NeoCon show in Chicago last June. Strong Products Group, Dallas. www.connectrac.com CIRCLE 226

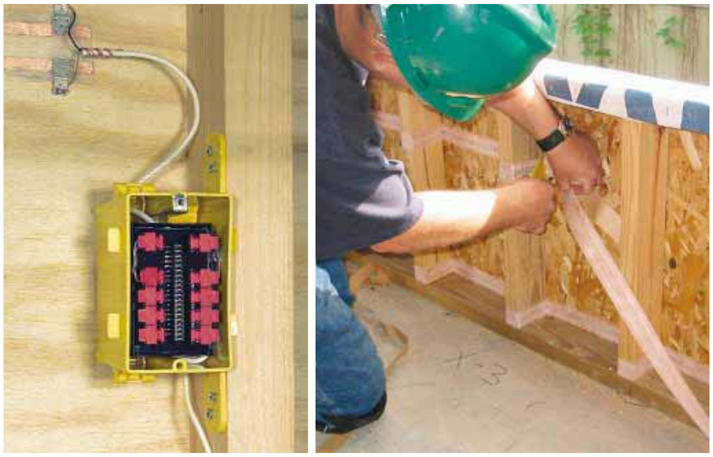


► Classically styled stained-glass windows



Meyda Tiffany, a New York State manufacturer and designer of Tiffany lamps and decorative lighting, has introduced more than 100 new stained-glass windows. Ranging from botanical to wildlife themes, the windows feature handcrafted pieces of glass in a spectrum of colors. The 20" x 38" Oval Peacock window (right) showcases a Peacock with colorful feathers in greens, blues, and reds. Other window themes include Tulips and Fleurs; Cat, Tulips, and Peaches; The Catch of the Grizzly; Nouveau Lily; and Diamond Grapevine. Meyda Tiffany, Yorkville, N.Y. www.meyda.com **CIRCLE 229**

Product Briefs



▲ Monitoring water intrusion

Detec Systems works with architects and developers to install sensors within the building envelope of new or existing structures to protect against moisture damage and the long-term effects (rot, mold growth, air-quality degradation) associated with it. Detec offers the first commercially available moisture-detection and -monitoring system for wood, masonry, and steel-frame structures. The system includes moisture-detection tape (above right), which monitors moisture levels in the building's wall cavities and exterior sheathing materials, and remote-zone sensors (above left) that can accept up to eight wired inputs. Detec Systems, Conover, N.C. www.detecsystems.com **CIRCLE 230**

► Integral push plate

BEA introduces the Panther Series door activation push plates. The wireless units install quickly to provide reliable activation of swinging, bifold, low-energy, and rolling industrial doors. The push plate arrives as a fully assembled unit, with an integrated RF 433 transmitter. The design eliminates the need to purchase the plate and transmitter separately and then install each at the service site. The plate's fully waterproof construction withstands the elements for outdoor installation. BEA, Pittsburgh. www.beainc.com **CIRCLE 231**

▼ Responsible to the core

VT Industries now offers a new generation of environmentally responsible architectural wood doors manufactured from rapidly renewable agricultural fibers. The new core material is manufactured from components such as wheat straw, soybean straw, and sunflower hulls, and is bonded together with formaldehyde-free resins. Limited door sizes are available with 45-minute and 60-minute fire ratings. VT Industries, Holstein, Iowa. www.vtindustries.com **CIRCLE 232**

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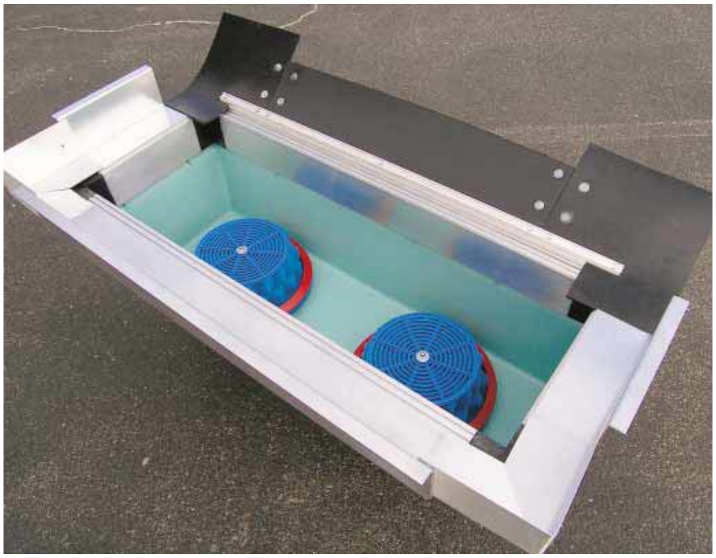
Hurricane Season couldn't blow our house in!
Not by the hair of our chiny-chin-chin

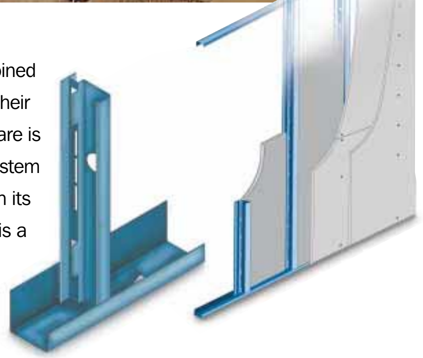
▼ Stormwater filtration system

To address increasing concerns with stormwater runoff from bridges and highways that pollute waterways, Transpo has introduced the EnviroSafe Modular Stormwater Catch Basin Filter System. This technology can be an asset to any Best Management Practice programs in meeting the objectives of NPDES II rules enforced by the EPA. Configurable for a wide array of pollutants such as debris, sediment, oils, metals, organics, and bacteria, the stormwater-management system features large volume-capture capacity, high filter-flow rates, low maintenance cycles, and easy replacement of filter cartridges. Transpo Industries, New Rochelle, N.Y. www.transpo.com **CIRCLE 233**



▲► Steel framing systems

Marino\Ware and Allied Studco have joined together to expand the distribution of their steel truss systems (above). Marino\Ware is incorporating Allied Studco's AmKey System as TrussRite, one of the components in its FrameRite Building System. TrussRite is a cold-formed steel truss system designed and engineered using advanced software and sealed by a licensed engineer. Fabricated trusses offer superior lateral stability and span capabilities. Also new from Marino\Ware, the CT-Stud system (right) provides protection against the spread of fire in elevator shafts, stairwells, and other enclosures when built with any UL-approved gypsum liner board. Marino\Ware, South Plainfield, N.J. www.marinoware.com **CIRCLE 234**



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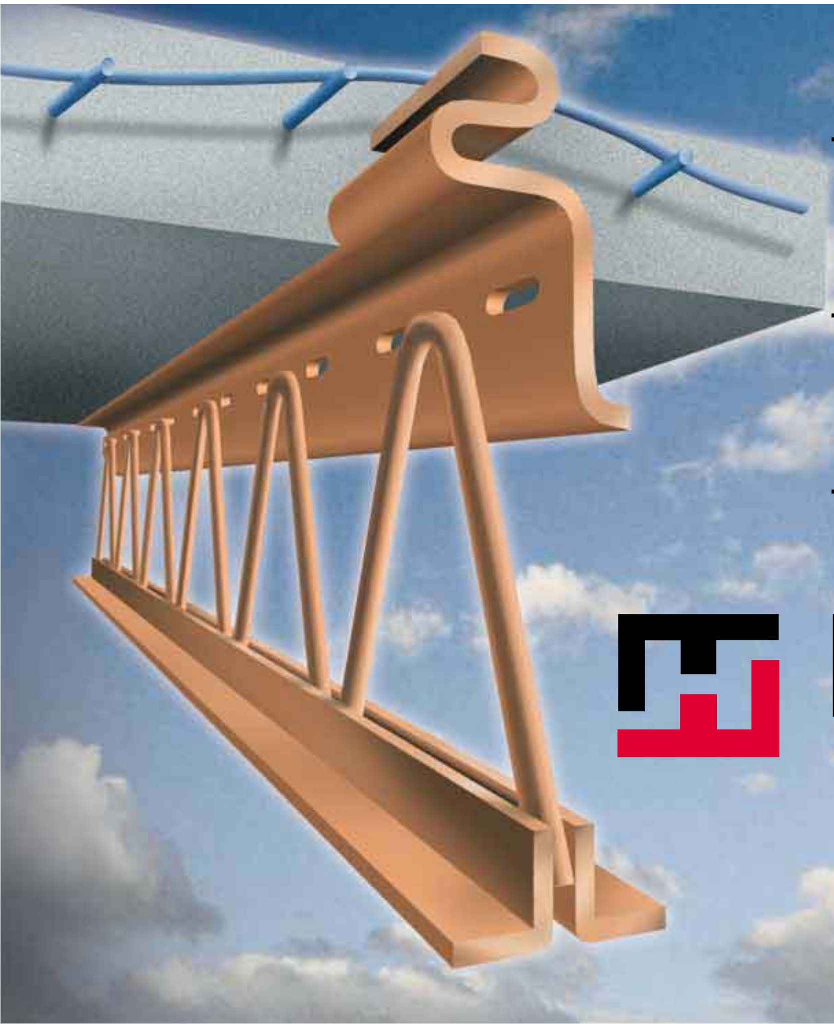

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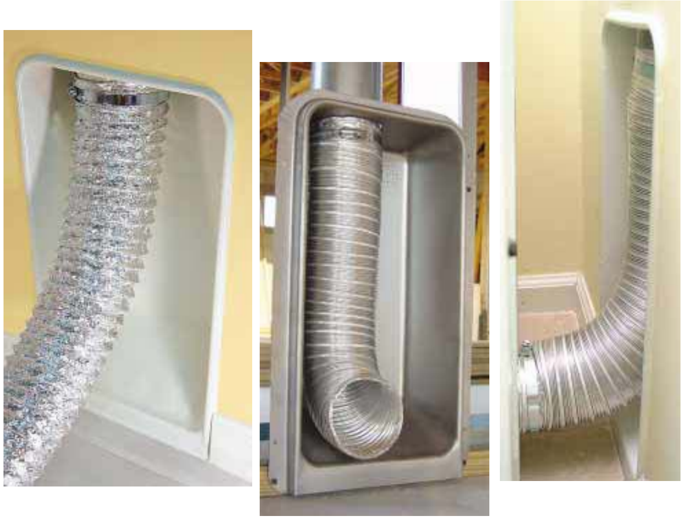
Product Briefs



▲ Getting the kinks out

The Dryerbox, from In-O-Vate Technologies, allows the dryer appliance to be located all the way back against the wall, instead of several inches away. The 21"-high metal receptacle, which is UL Classified for a 1-hour wall, houses and collects the flex dryer hose in the cell of the wall. Eliminating the bends in the flex exhaust hose provides for less restrictive airflow, which in turn minimizes lint buildup, saves energy costs, and reduces the serious fire hazard caused by lint buildup. In-O-Vate Technologies, Jupiter, Fla. www.dryerbox.com **CIRCLE 237**

► Great connections

Cambridge Architectural Mesh offers a series of installation systems for its Veil, Drape, Fill, and Panel products. Cambridge offers complete engineering support, from design concept and specification through installation. Frame (right) features angle bar frame expanses of mesh with a combination of welded mechanical connections. Cambridge Architectural Mesh, Cambridge, Maryland. www.architecturalmesh.com **CIRCLE 238**

▼ Penetrating tiles

Using a proprietary blending technique, photographer Joel Kaye's original artwork is sealed into the surface of fade-, water-, and heat-proof-ceramic or tumbled-marble-stone tiles (left). According to Kaye, a special type of ink distribution system penetrates deeply and causes the image to become embedded into the tile. Kaye recently displayed tiles featuring his photos of New York City at Bloomingdale's, N.Y. Picture That, Rego Park, N.Y. www.picthat.com **CIRCLE 239**

For more information, circle item numbers on Reader Service Card or go to www.archrecord.com, under Products, then Reader Service.

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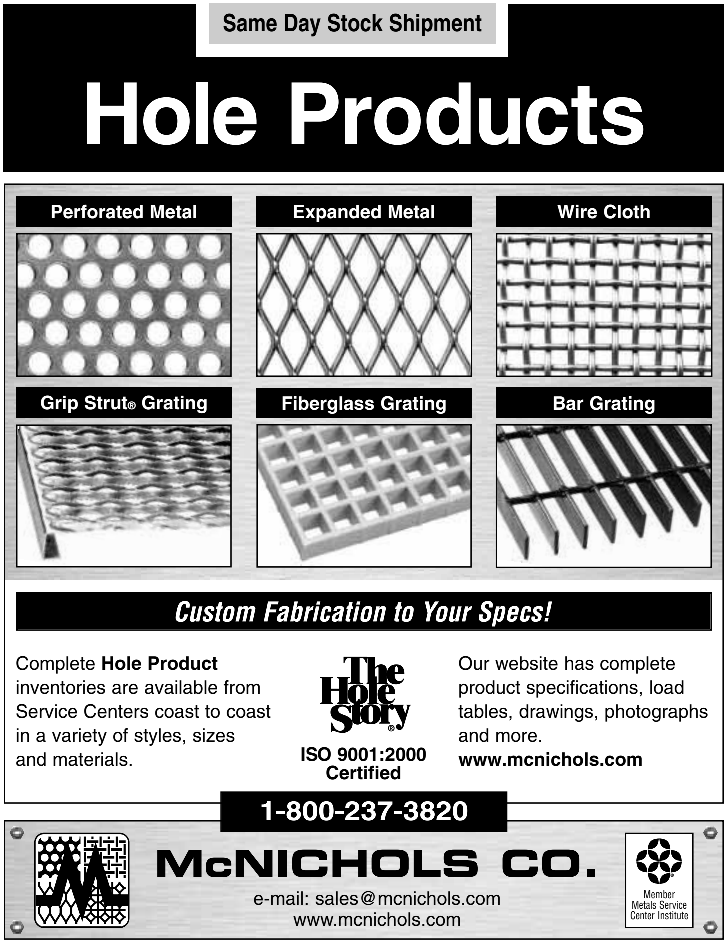

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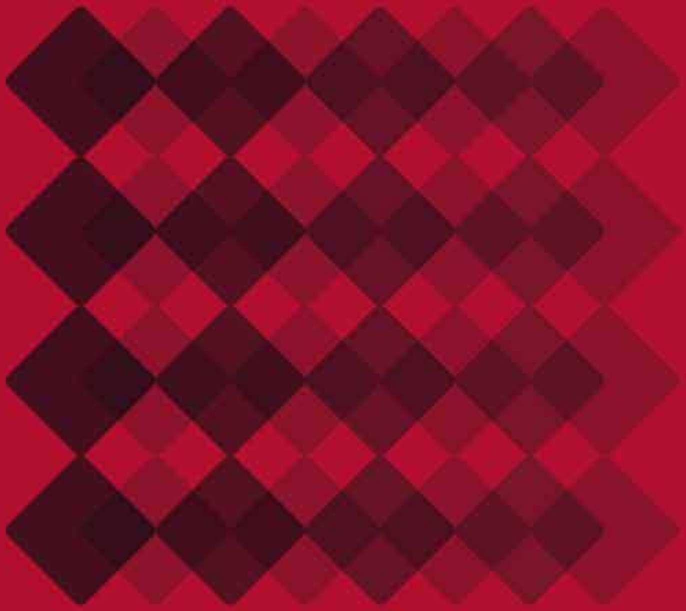

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Product Resource: Literature

JM
Cool Roof Solutions

Cool roof info

The Johns Manville Roofing Systems Group has announced an initiative to provide up-to-date information on cool-roof solutions. The initiative includes detailed information on the new standards under Title 24 to address energy-efficient roofing solutions in California. The information is available for free in three formats: a comprehensive Web site, a free CD, or a printed packet. Johns Manville, Denver. www.jmcoolroofs.com **CIRCLE 240**

Glass comparison kit

Get a clearer picture:
True color clarity
and solar control
in one brilliant,
affordable package.
SOLARBAN 60
Starphire

PPG Industries offers a Solarban 60 Starphire comparison kit to demonstrate the clarity of Solarban 60 Starphire when compared to traditional clear, solar-control, low-E glass. The kit features two standard 1" insulating glass units (IGU) set side-by-side against a white background. One IGU features traditional glass with a leading solar control low-E coating, while the other shows Solarban 60 combined with Starphire Ultra-Clear glass. PPG Industries, Pittsburgh. www.ppgideascapes.com **CIRCLE 241**

Our automated waste collection technology is transforming how you approach master planning and facility design.
PAC

Automated waste collection lit

A new brochure from Precision AirConvey showcases the company's computer-controlled automated waste and linen handling systems that pneumatically convey refuse and/or soiled linens from multiple points in a facility to a central remote or on-site location. The brochure highlights opportunities for system installation in hospitals, hotels, and other facilities. Precision AirConvey, Newark, Del. www.automatedwastecollection.com **CIRCLE 242**

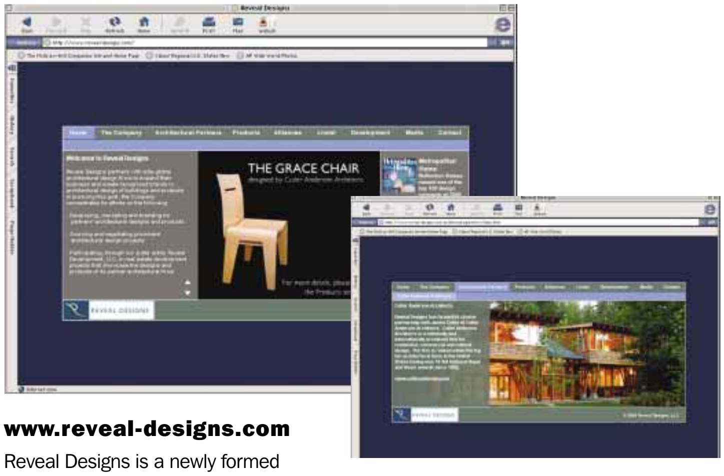
Wiring devices/controls brochure

DECORA ENHANCED LIVING
LEVITON

Leviton's *Decora Enhanced Living* brochure illustrates the ways that lighting designers, architects, and builders can apply Decora dimmers, electronic timers, and occupancy sensors for high-end residential applications. The brochure showcases a comprehensive offering of Decora products on a room-by-room basis. Leviton, Little Neck, N.Y. www.leviton.com **CIRCLE 243**

For more information, circle item numbers on Reader Service Card or go to www.archrecord.com, under Products, then Reader Service.

Product Resource: On the Web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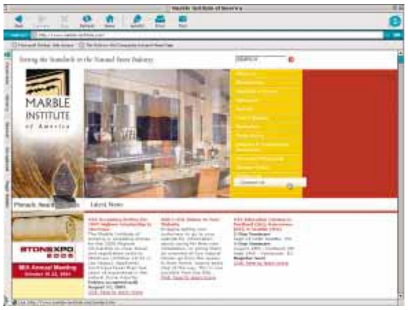
REVEAL DESIGNS

www.reveal-designs.com

Reveal Designs is a newly formed company that partners with elite global architectural firms to create recognizable brands in the design of buildings and products. The Grace Chair, highlighted on Reveal Design's home page (above left), is part of a new line of products designed by James Cutler/Cutler Anderson Architects and offered exclusively through the company.

www.marble-institute.com

The Marble Institute of America (MIA) has launched a redesigned Web site that incorporates information for members, nonmembers, and consumers. The multipage site includes a members forum, a secure online publication-ordering system, and the latest news from the association.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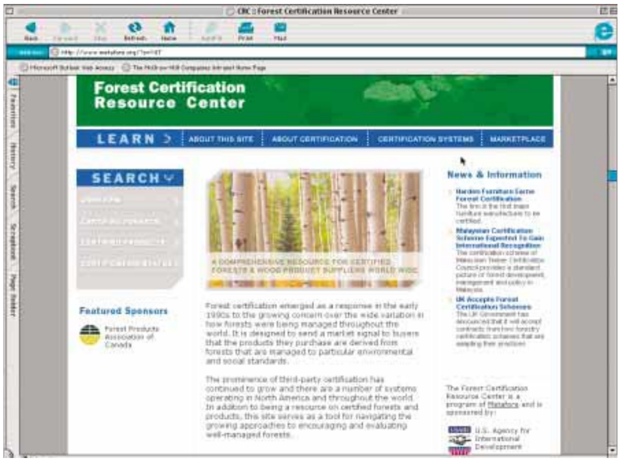
STONEXPO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Metafore is a nonprofit organization that seeks out business and other civil society leaders who recognize the connection between business prosperity and forest integrity. The company has launched a redesigned and enhanced Forest Certification Resource Center Web site to provide forest certification information to a diverse audience.

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Dates & Events

New & Upcoming Exhibitions

Sacral Space: Modern Finnish Churches
Seattle
October 7–November 13, 2005
This exhibition presents 12 Modern Finnish churches, which demonstrate the remarkable quality of Modern Finnish architecture. *Sacral Space* includes drawings, photographs, videos, and three-dimensional drawings. At the Heritage Nordic Museum. For information, call 206/789-5707 or visit www.nordicmuseum.org.

Solar Decathlon
Washington, D.C.
October 7–16, 2005
The *Solar Decathlon* presents cutting-edge architecture, engineering, and technology, all of which can be applied when building homes to generate their own energy, not simply consume it. The U.S. Department of Energy announced 18 teams that will compete to see who can build and operate the best-designed and most energy-efficient solar-powered home. On the National Mall. For more information, visit www.solardecathlon.org.

ReThink/ReDesign/ReCycle
Chicago
Opening: October 14, 2005
The ongoing exhibition *Competition: Public Process for Public Architecture* will be updated with the display of more than 100 entries for the competition to design on-street recycling bins created by members of the City of Chicago and the AIA Chicago Young Architects Forum. At the CAF's CitySpace Gallery. Call 312/922-3432 or visit www.architecture.org.

Plain of Heaven
New York City
October 14–November 20, 2005
An international exhibition inspired by the impending redevelopment of the High Line, the disused elevated rail structure that runs up the West Side of Manhattan. The title, *The Plain of Heaven*, adapted from a painting by British artist John Martin (1789–1854), refers to the idea of an elevated, sublime environment that lies just beyond our reach, yet is firmly planted in our aspirations and imagination. At 820 Washington Street at the end of the High Line. Visit www.thehighline.org.

Ongoing Exhibitions

Going, Going, Gone? Mid-Century Modern Architecture in South Florida
Fort Lauderdale, Fla.
Through October 30, 2005
A photographic journey through Broward and Miami-Dade counties, featuring the photographs of Robin Hill. At the Museum of Art. Call 954/525-5500 or visit www.moafl.org.

The High Line
New York City
Through October 31, 2005
This exhibition features Field Operations and Diller Scofidio + Renfro's winning entry for the redesign of the High Line, the defunct, elevated railway bed that runs along Manhattan's far West Side. In the Architecture and Design Gallery at the Museum of Modern Art (MoMA). Call 212/708-9400 or visit www.moma.org.

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Dates & Events

Frank Lloyd Wright and Taliesin: The Photographs of Pedro Guerrero
Chicago
Through November 19, 2005
From 1939, when Taliesin set up its western front in Arizona, to the death of Wright in 1959, Guerrero created some of the greatest architectural photographs of the last century. At Architech Gallery. For information, call 312/475-1290 or visit www.architechgallery.

International Arts and Crafts
Indianapolis
Through January 2006
Organized by the Victoria and Albert Museum in London, the exhibition features more than 300 objects from Great Britain, where the Arts and Crafts movement began, as well as America, Europe, and Japan—where it developed as the *mingei*, or folk craft, movement. At the Indianapolis Museum of Art. Visit www.ima-art.org or call 317/923-1331.

Lectures, Conferences, and Symposia

Communities on the Line: Transit and the Design of 21st Century Communities
Washington, D.C.
October 7–9, 2005
Keynote addresses, educational sessions, and tours that illustrate the history and state-of-the-art practice for transit-oriented development and the role of transit in community building. At the Wyndham City Center Hotel. For more information, visit www.aia.org.

The Founding Myths of Architecture Conference
Valletta, Malta
October 7–9, 2005
The conference presents a series of talks inspired by the mythology of architecture by an international group of architects, architectural critics, and historians. At Auberge de Provence (National Museum of Archaeology). Call 00356/212-43981 or visit www.ap.com.mt.

Hem C. Gupta Lecture: Will Alsop, Will Alsop Design Ltd.
Chicago
October 10, 2005
Will Alsop says his mission is “to give the world extraordinary objects of desire.” He will speak about how he accomplishes this goal while setting new standards for sustainable design and technology. At the ArchiCenter. Call 312/942-3432 or visit www.architecture.org.

Conrad Buff III and Donald Hensman Home Tour
Pasadena, Calif.
October 11, 14, and 15, 2005
A three-day event featuring a home tour, symposium, and reception. The tour will consist of six Buff and Hensman homes in the Pasadena, Altadena, and Linda Vista areas, some of which have been unavailable to the public until now. For information, call 626/793-3334.

SAIE Concrete 2005
Bologna, Italy
October 12–16, 2005
SAIE-The International Building Show will focus on reinforced concrete and related areas. At the Palazzo dei Congressi, Sala Italia. Visit www.saie.bolognafiere.it.

11th International Conference of National Trusts: Sustaining World Heritage in the 21st Century
Washington, D.C.
October 15–19, 2005
A premier international education event focusing on the preservation of the world’s historic places and communities. At the Mayflower Hotel. Call 202/588-6100 or visit www.nationaltrust.org/international.

2005 Baltimore Architecture Week and Excellence in Design Awards
Baltimore
October 15–22, 2005
With a spotlight on architecture, this week-long series of events will emphasize the importance of our built environment, from our rich architectural and historic heritage to current policies, issues, and projects to our dreams and aspirations for our city. For more information, call 410/625-2585 or visit www.aiabalt.com.

62nd SMACNA Annual Convention and Product Show
Palm Desert, Calif.
October 16–20, 2005
The Sheet Metal and Air-Conditioning Contractors’ National Association (SMACNA) event will host a wide variety of educational and

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self-development sessions presented by industry experts. At Desert Springs, a JW Marriott Resort and Spa. Call 703/803-2998 or visit www.smacna.org.

Classical Spain: Art & Architecture of Madrid, Toledo, and Segovia
Madrid
October 16–23, 2005
Walking tours, lectures, and expert guides will emphasize extraordinary architecture and art spanning the Romanesque, Baroque, and Neoclassical periods in Madrid and surrounding cities. For information, call 800/390-5536 or visit www.classicalexcursions.com.

28th Annual Decorative Arts Symposium
Pittsburgh
October 17, 2005
Paul Miller, the curator of the Preservation Society of Newport County, and Richard Guy Wilson, Commonwealth Professor in Architectural History at the University of Virginia, are the speakers for this year's symposium, sponsored by the Women's Committee of Carnegie Museum of Art. Their topic will be "The Gilded Age: Newport and its Mansions." At Carnegie Music Hall. Call 412/622-3131 or visit www.cmoa.org.

Ballparks, Eminent Domain, and the Need for a D.C. Planning Commission
Washington, D.C.
October 17, 2005
This symposium will examine other cities' experiences with a planning commission and suggest how such a government agency could help coordinate D.C. to align the expenditure of public funds with planning visions and economic development objectives. At the National Building Museum. Call 202/272-2448 or visit www.nbm.org.

Lectures from the Edges of Architecture: Model Homes
Chicago
October 18, 2005
Artist and architect Mark Robbins discusses how social and political forces affect the built environment. At the ArchiCenter. Call 312/922-3432 or visit www.architecture.org.

CSI Conference: New Trends in Construction Specifications
New York City
October 19, 2005
This one-day trade fair includes educational seminars with keynote guest speaker Randy Croxton of Croxton Collaborative. At Gotham Hall. Call 908/284-1676 or visit www.metrobuilding.biz.

Musei & Musei Conference
Brescia, Italy
October 19–21, 2005
A conference-exhibition of museums from around the world. Visit www.museiemusei.it.

Delaware Green Building Convention
Wilmington, Del.
October 20, 2005
The theme of this year's statewide design convention will be "Building Green," to help promote environmentally appropriate solutions to the built environment. At the Bank One Center. Call 302/654-9817 or visit www.aiadelaware.org.

Masonic & Esoteric Heritage: A New Perspective for Art and Conservation Policies
The Haag, the Netherlands
October 20–21, 2005
This conference will introduce participants to the rich material culture of Western esotericism. At the National Library of the Netherlands. Visit www.freemasons-freemasonry.com.

StonExpo 2005
Las Vegas
October 20–22, 2005
This show, which was recently purchased by Hanley Wood, will introduce a diverse audience of stone professionals to leading manufacturers of stone products, services, and supplies. At the Las Vegas Convention Center. Call 866/550-6808 or 972/536-6440 or visit www.StonExpo.com.

2005 ASAI Conference
Washington, D.C.
October 20–22, 2005
The American Society of Architectural Illustrators (ASAI) celebrates its 20th anniversary this fall with its Washington conference, its annual award ceremony, and the premier of its annual exhibition, *Architecture in Perspective*. Visit www.asai.org or www.drawingdc.org.

IALD 5th Annual Education Conference: Lighting the Future
Alexandria, Va.
October 21–22, 2005
The International Association of Lighting

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Designers (IALD) Education Conference highlights advances in lighting technology and design, and aids professional development. At the Hilton Alexandria Mark Center. Call 312/527-3677 or visit www.iald.org.

U.S. Green Building Council: Winner of 2005 Turner Prize Presentation
Washington, D.C.
October 24, 2005
The U.S. Green Building Council (USGBC) will receive the 2005 Henry C. Turner Prize for Innovation in Construction Technology in recognition of its promotion of sustainable design and building practices and development of the LEED certification program. At the National Building Museum. Call 202/272-2448 or visit www.nbm.org.

2005 TPELight & ShenzhenLight
Shenzhen, China
October 24–27, 2005
The 17th Taipei International Lighting Fair (TPE-LIGHT) & 3rd China (Shenzhen) International Lighting Fair. At the Shenzhen Convention & Exhibition Center. Visit www.lightingchina.com.cn, www.lighting.org.tw, or www.utex.com.cn for more information.

Snøhetta: Craig Dykers
Washington, D.C.
October 25, 2005
Craig Dykers, a founding principal of the Norwegian firm Snøhetta, will discuss the cultural center that will become part of the complex of structures at the former World Trade Center site in New York City, and some of his studio's other internationally acclaimed projects. At the National Building Museum. Call 202/272-2448 or visit www.nbm.org.

Preservation North Carolina (PNC) 2005 Annual Conference
Gastonia, N.C.
October 26–29, 2005
This conference, titled "New Life for Old Mills: The Economic and Community Benefits of Adaptive Use," will add to the usual mix of preservation education and interaction, Call 919/832-3652 or visit www.preservationnc.org for further information.

Strategies for Revitalizing Downtowns
Washington, D.C.
October 27, 2005
Though every downtown is different, common revitalization lessons can be applied anywhere. Christopher Leinberger, partner in Albuquerque's Historic District Improvement Company and visiting fellow at the Brookings Institution, will discuss these lessons and the fundamentals for a downtown turnaround plan. At the National Building Museum. Call 202/272-2448 or visit www.nbm.org.

Lecture: Eero Saarinen
Washington, D.C.
October 27, 2005
Architectural historian Jayne Merkel will discuss the life and work of Saarinen, now considered to be one of the most influential architects of the 20th century. At the National Building Museum. Call 202/272-2448 or visit www.nbm.org.

The Building Code & Historic Preservation on Main Street Symposium
Decatur, Ala.
October 27–28, 2005
A two-day symposium devoted to compliance disciplines in downtown revitalization and historic property restoration and rehabilitation, focusing on code compliance, structural engineering issues, and federal rehabilitation tax credits for existing historic buildings. At the Princess Theater. Call 256/350-5060 or 334/242-3184.

53rd AWI Annual Meeting & Convention
San Diego
October 27–29, 2005
The Architectural Woodwork Institute's (AWI) annual convention brings members from across North America together. At the Hilton San Diego Resort. Call 703/733-0600 or visit www.awinet.org.

National Building Museum's 25th Anniversary Bash
Washington, D.C.
October 29, 2005
All ticket revenues go to support the museum's education programs and exhibitions. In the historic Great Hall at the National Building Museum. Call 202/272-2448 or visit www.nbm.org.

Intown Living Around the Country and in D.C.
Washington, D.C.
October 31, 2005
Across the country, people are returning downtown to live and play. Ann Breen and Dick Rigby, cofounders of the Washington, D.C.–based

Waterfront Center, have studied this phenomenon in eight cities. They will present their findings and briefly relate them to Washington. At the National Building Museum. Call 202/272-2448 or visit www.nbm.org.

ArchiFest
Los Angeles
October 2005
In recognition of the achievements of the Frank Lloyd Wright Conservancy, the Los Angeles City Council declared October 2005 "Architecture Month." ArchiFest will include exhibitions, tours, performances, screenings, and more. Call 312/663-5500 or visit www.savewright.org.

Safe: Design Takes On Risk—
Embrace Your Fear: A Symposium
New York City
November 4, 2005
In this all-day symposium held in conjunction with the Museum of Modern Art show *Safe: Design Takes on Risk*, designers, scholars, representatives from government offices, and others address the different ways that they approach safety and risk, through individual presentations and a roundtable discussion. At the museum's Titus Theater 1. Call 212/708-9431 or visit www.moma.org.

Competitions

Tsunami Memorial Design Competition
Registration: September 15–November 15, 2005
The government of Thailand is staging the Tsunami Memorial Design Competition to gather and develop concepts for a Tsunami Memorial, which will be built to honor and commemorate the victims, both Thai and foreign, of the December 26 tsunami. In addition, it will acknowledge the people across the globe who provided assistance and relief. Visit www.tsunamimemorial.or.th or e-mail info@tsunamimemorial.or.th.

Southpoint: From Ruin to Rejuvenation—the Roosevelt Island Universal Arts Center International Ideas Competition
Registration: September 1–November 18, 2005
Deadline: January 13, 2006
The Emerging New York Architects Committee, AIA N.Y. Chapter, announces the second biennial international ideas competition to explore issues of universal design and historic rejuvenation in developing a visual/performing arts center on Roosevelt Island. For more information, visit www.enyacompetitions.org.

IIDA INawards
Deadline: October 14, 2005
The IIDA Northern Pacific Chapter's INawards is a juried competition for interior design excellence and innovation. Interior designers, architects, and industrial designers form the Northern Pacific Chapter can submit entries of interior spaces and products completed after January 2003. Visit www.iida-northernpacific.org.

SBIC 2005 Awards Program
Deadline: October 21, 2005
For the fifth year in a row, the Sustainable Buildings Industry Council (SBIC) will recognize professionals who are making exceptional contributions to sustainability across the United States. For further information, visit www.sbicouncil.org.

Bienal Miami+Beach 2005: Architecture, Landscape Architecture, Interior Design
Submission Deadline: October 28, 2005
As part of the series of events of architecture week, architects and designers from around the world are welcome to participate in exhibitions, conferences, competitions, workshops, and seminars. Call 305/348-3031 or visit www.bienalmiami.com.

Ambiance Design Competition
Deadline October 31, 2005
This competition is designed to highlight the innovative and fashion-driven applications of Ambiance Low Voltage Lighting Systems developed by industry tradespeople, including lighting consultants, designers, contractors, architects, and sales personnel. For more information, call 1-856/764-0500 ext. 7443 or visit www.ambiancelightingsystems.com.

2005 NSA Sunroom Design Awards Competition
Deadline: October 31, 2005
Judged in three cost levels as well as type of roof category, the National Sunroom Association (NSA) Design Awards Competition recognizes excellence in design and installation of sunrooms. For additional information, visit www.nationalsunroom.org.

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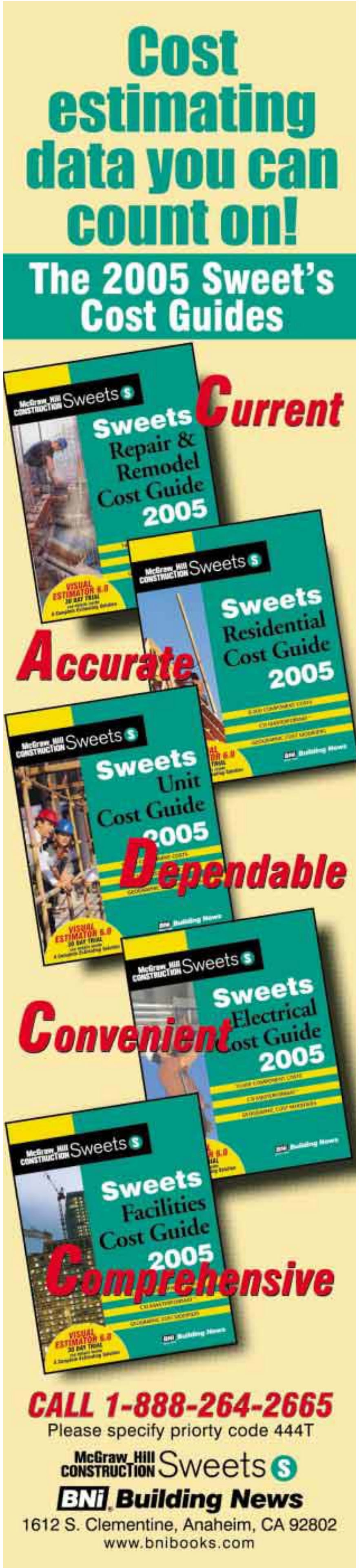
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Dates & Events

Rieger Graham Prize

Deadline: November 1, 2005

The Rieger Graham Prize is an award created by the Institute of Classical Architecture to advance the career and professional skills of a recent graduate of architecture or its allied arts. For more information, please visit www.classicist.org.

Rome Prize 2006

Deadline: November 1, 2005

The American Academy in Rome invites applications for the Rome Prize competition, in which fellowships are awarded in independent study and advanced research in the arts and humanities. Architecture, Design, Historic Preservation and Conservation are some of the fields awarded. For further information, call 212/751-7200, ext. 47 or visit www.aarome.org.

Urban Voids: Grounds for Change—An International Design Ideas Competition

Registration Deadline: November 14, 2005

Participants from around the world are invited to suggest compelling ideas for Philadelphia's vacant land and imagine fantastic long-term solutions that inspire change and reshape urban and natural forms throughout the city. The competition seeks answers to the question, "How can a city respond to the crisis of vacancy?" With more than 40,000 vacant properties representing nearly 1,000 acres, Philadelphia has become one of the nation's foremost examples of urban abandonment and extensive sprawl. For more information, visit www.vanalen.org/urbanvoids.

E-mail event and competition information two months before event or submission deadline to elisabeth_broome@mcgraw-hill.com. Edited by Alexandra Gates.

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exhibitions

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Jewish Washington: Scrapbook of an American Community

through January 8, 2006

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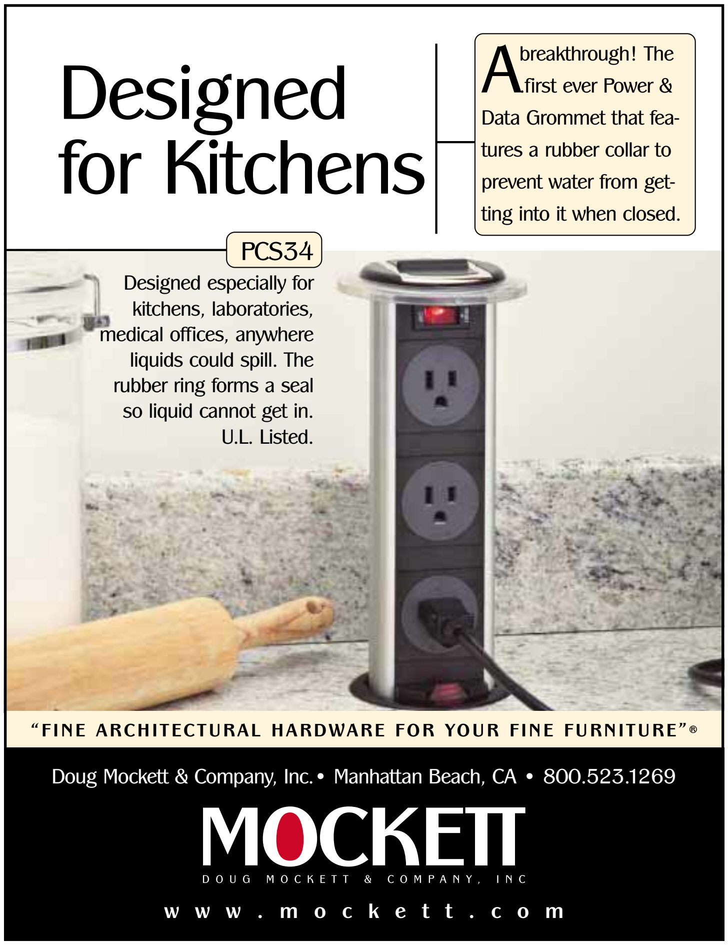
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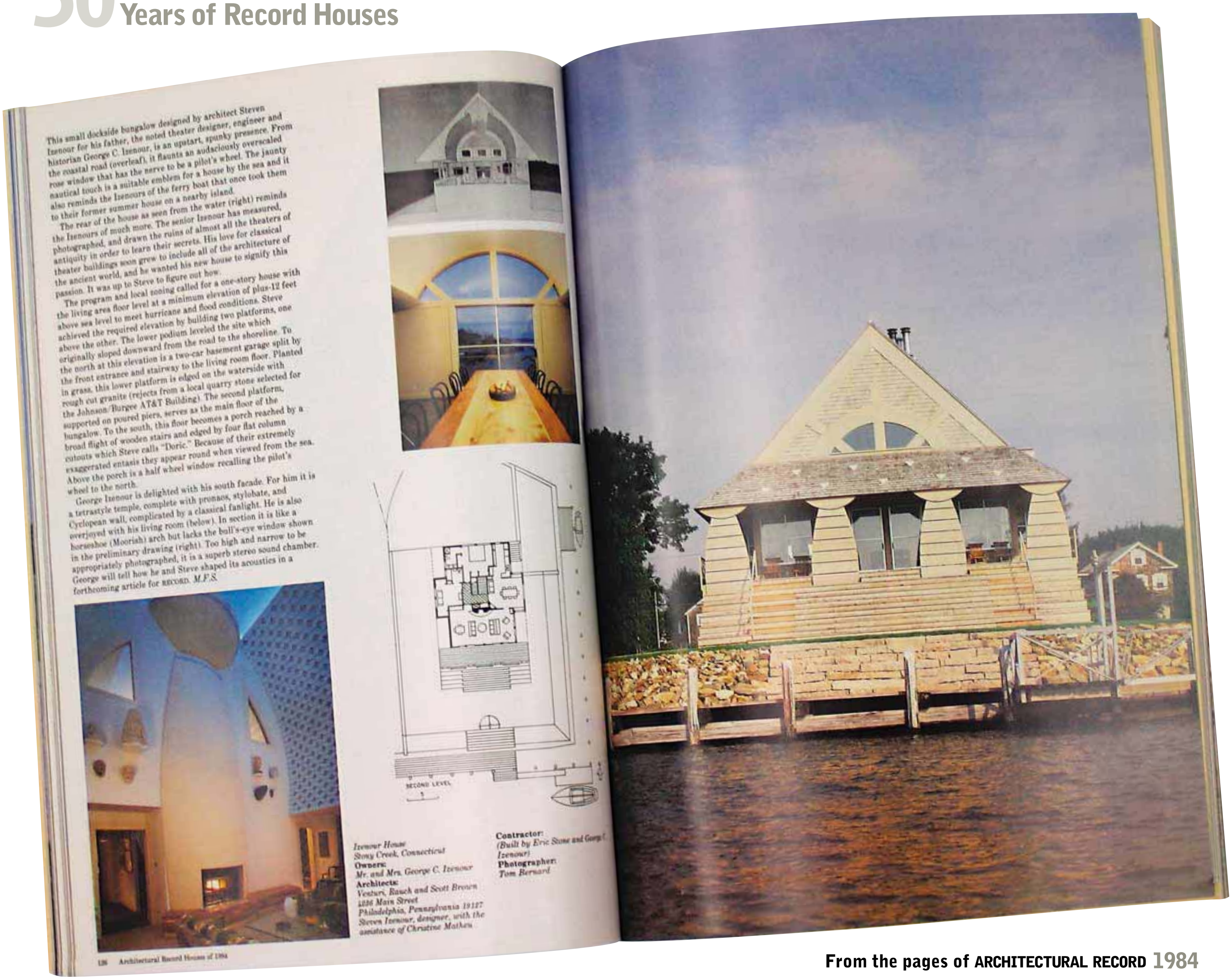


This small dockside bungalow designed by architect Steven Izenour for his father, the noted theater designer, engineer and historian George C. Izenour, is an upstart, spunky presence. From the coastal road (overleaf), it flaunts an audaciously overscaled rose window that has the nerve to be a pilot's wheel. The jaunty nautical touch is a suitable emblem for a house by the sea and it also reminds the Izenours of the ferry boat that once took them to their former summer house on a nearby island.

The rear of the house as seen from the water (right) reminds the Izenours of much more. The senior Izenour has measured, photographed, and drawn the ruins of almost all the theaters of antiquity in order to learn their secrets. His love for classical theater buildings soon grew to include all of the architecture of the ancient world, and he wanted his new house to signify this passion. It was up to Steve to figure out how.

The program and local zoning called for a one-story house with the living area floor level at a minimum elevation of plus-12 feet above sea level to meet hurricane and flood conditions. Steve achieved the required elevation by building two platforms, one above the other. The lower podium leveled the site which originally sloped downward from the road to the shoreline. To the north at this elevation is a two-car basement garage split by the front entrance and stairway to the living room floor. Planted in grass, this lower platform is edged on the waterside with rough cut granite (rejects from a local quarry stone selected for the Johnson/Burgee AT&T Building). The second platform, supported on poured piers, serves as the main floor of the bungalow. To the south, this floor becomes a porch reached by a broad flight of wooden stairs and edged by four flat column cutouts which Steve calls "Doric." Because of their extremely exaggerated entasis they appear round when viewed from the sea. Above the porch is a half wheel window recalling the pilot's wheel to the north.

George Izenour is delighted with his south facade. For him it is a tetrastyle temple, complete with pronaos, stylobate, and Cyclopean wall, complicated by a classical fanlight. He is also overjoyed with his living room (below). In section it is like a horseshoe (Moorish) arch but lacks the bull's-eye window shown in the preliminary drawing (right). Too high and narrow to be appropriately photographed, it is a superb stereo sound chamber. George will tell how he and Steve shaped its acoustics in a forthcoming article for RECORD. *M.F.S.*

Izenour House
Stony Creek, Connecticut
Owners:
Mr. and Mrs. George C. Izenour
Architects:
Venturi, Rauch and Scott Brown
4236 Main Street
Philadelphia, Pennsylvania 19127
Steven Izenour, designer, with the assistance of Christine Mathew

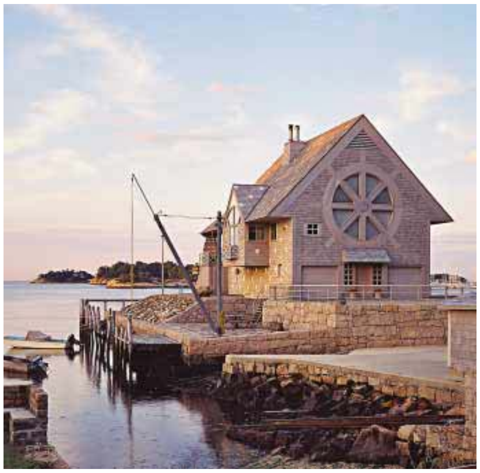
Contractor:
(Built by Eric Stone and George C. Izenour)
Photographer:
Tom Bernard

126 Architectural Record Houses of 1984

From the pages of ARCHITECTURAL RECORD 1984

An Era's Icon Is Remodeled

By Suzanne Stephens

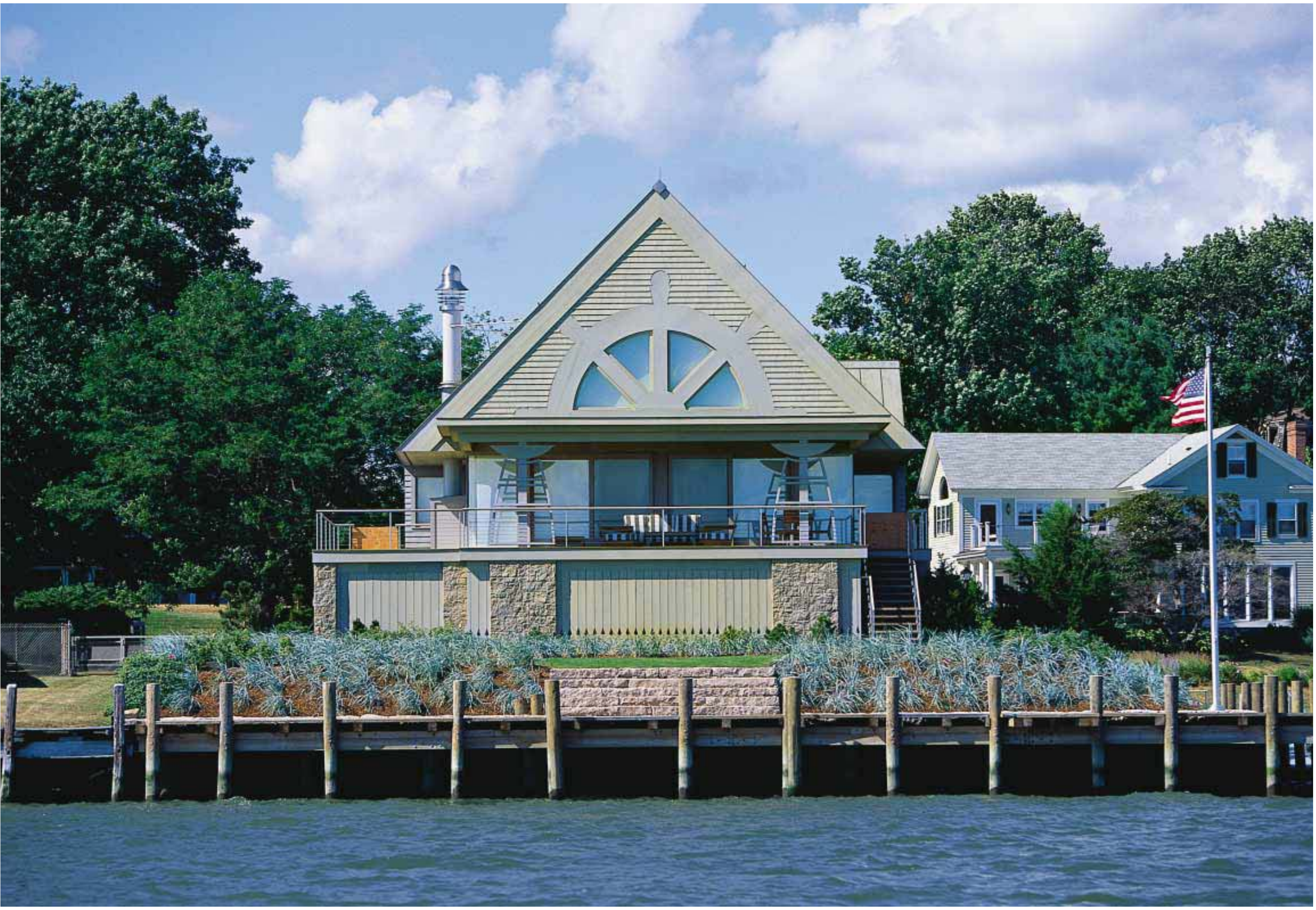


PHOTOGRAPHY: © MATT WARGO (BOTTOM)

Nothing is forever, not even a Record House from mid-April 1984. And while it seems a little soon for a 20-something structure to be remodeled, the Izenour House, in Stony Creek, Connecticut, designed by Venturi Rauch and Scott Brown Architects (now Venturi, Scott Brown and Associates), has just been through a facelift under a new owner.

The Izenour House has long been an icon of Postmodern design, with its exaggerated gable roof; cartoon-size, flat, fat columns; and pilot's-wheel window. Built for George Izenour, the theater designer, the house has a special meaning since his son, the late Steven Izenour, an integral member of the firm that created the building, was its principle designer.

When Alan Landis, a real estate investor, bought the house two years ago from George Izenour, he wanted to renovate it, in some cases replacing exterior materials with more durable and expensive ones. Landis commissioned Connecticut architect Nelson Denny (who had studied at Yale's architecture school under Charles Moore in the late 1960s) to undertake the renovation: Denny substituted a standing-seam, lead-coated copper for the original



This page: **A radical remodeling was undertaken on the south facade (above), which included removing the fat columns (seen in the original photograph, below) and wide stair.**

Previous page: **The original north facade (bottom) has fewer changes.**

(continued from previous page) cedar-shingle roof, re-sided the cedar-shingle exterior walls, added teak trim instead of cedar to windows and doors, and inserted a new steel frame in the house, among other moves.

The north facade, with its huge pilot's-wheel window, has retained much of its appearance. However, on the south facade facing the Long Island Sound, Denny removed the fat columns and a broad expanse of exterior stairs leading to the waterfront. As Landis explains, the decorative columns blocked the view, so he and Denny kept only two of the four columns, now rendered in galvanized tubing. Denny incorporated the cascade of outdoor stairs into the body of the house to enlarge interior spaces by about 500 square feet, and added a deck and hot tub. He also removed the sloping shingle roof, and inserted a flat, lidlike canopy, thereby altering the proportions of the fan light and tympanum. Inside, the architect replaced the diamond-patterned, parabolic ceiling with a coffered, barrel-vaulted one, again to give the interior more space. Presumably, however, such an alteration would affect George Izenour's carefully engineered acoustics.

All in all, it was an expensive and elaborate process, executed to address the particular needs and desires of the new owner, as well as solve the wear-and-tear on a structure built on a somewhat modest budget. The problem is that the modifications rob the original of its design spirit. This is a situation many architects face with new owners of their houses and is one not easy to resolve. It should come as no surprise that neither George Izenour, now 93, nor his grandson, John (now with Venturi Scott Brown), has been to see the house. ■

PHOTOGRAPHY: © ROBERT BENSON (TOP); MATT WARGO (LEFT)